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3dcreative

Issue 060 August 2010



Interview
Maarten Verhoeven



The Gallery
Daniil V. Alikov, Dong Won Yang, Guillaume Cerdan & more!



Project Overview
"Max and Milton"
by Jason Baldwin & Joe Beckley



FREE – Inside Look!
Digital Art Masters:
Volume 4 Project Overview
by Andrius Balciunas

Look for this button inside

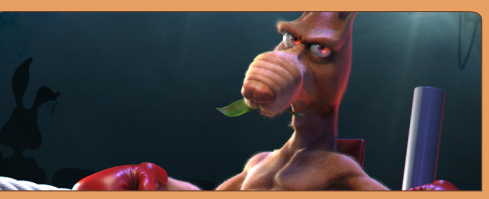


- Free Environment Lighting Artist Scene & Textures
- Free Rigging Scenes
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- Free Mudbox Videos

Cover Image by Maarten Verhoeven

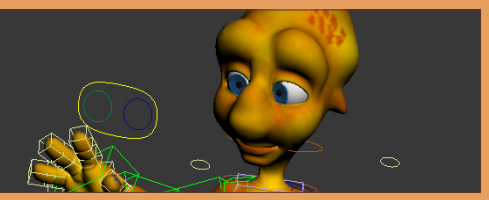
CHARACTERS

SCULPTING, RIGGING & TEXTURING



How to Stylize and Model Toon Animals

Jose Alves da Silva wraps up our **How to Stylize a Toon Animal** tutorial series this month covering texturing and post production.



Facial Rigging

In chapter 5 of our **Introduction to Rigging** tutorial series in 3dsmax & Maya our artists show us how to rig our characters face.



Creating A Female Zombie Character in Mudbox

Wayne Robson continues his **Mudbox Female Character Creation** tutorial series this month creating a Zombie character.



Indoor Environment Lighting: Artificial Light

Viktor Fretyán, **Jamie Cardoso**, **Luciano Iurino** and **Fredi Voss** continue to be our guiding light with chapter 3 of our Environment Lighting tutorial.



Editorial

Welcome to the 60th issue of 3DCreative magazine. We are slowly heading towards the end of the summer and soon the wind and rain will come, but it's not all doom and gloom as we have another splendid issue of 3DCreative for you.

This month's cover image is the handy work of this month's interviewed artist Maarten Verhoeven. Those of you who use 3DTotals galleries and forums and are regular readers of 3Dcreative will be aware of his work as it has featured in our galleries regularly. Maarten talks to us about what excites and inspires him in CG and shares some of his unique and fantastically executed characters with us.

Many of you will remember the excellent gallery image Max and Milton which featured in the April issue of 3DCreative. Well in this month's Making Of we are told how it was created by not one but two outstanding artists, Jason Baldwin and Joe Beckley. Jason deals with the design and sculpting whilst Joe tells us how he colored and textured the image entirely in Photoshop. I am sure you will agree the outcome is excellent, I think these guys are worth keeping an eye out for.

Ok so on to tutorials, this month we continue our Indoor Environment Lighting series and in this installment we take a look at some artificial lighting. This is a whole different ball game to the previous chapters as we now have to consider multiple lights from different directions and sources, but as always we are more than aptly guided through the process by Jamie Cardoso in 3ds max and Mental Ray, Viktor Fretyán in 3ds Max and Vray, Luciano Iurino in Maya and Mental ray and Fredi Voß in Cinema 4D.

We have all really loved the fantastic Stylized Cartoon Animal tutorial by Jose Alves da Silva, and this month's issue contains the last piece of the puzzle as Jose turns our attention to texturing and post production. Jose has done a great job of explaining his process in detail throughout the tutorial series, and the final chapter is no exception as Jose shows us a really useful tip for creating realistic looking fur and even throws in a reference to an image some of you may be familiar with, see if you can spot it.

Mudbox is our next port of call, and in this issue Wayne Robson steps from the real to unreal and shares the dark world of Zombies with us. Wayne explains how references can still be vital even when dealing with things that aren't real or quite as pleasant as we are used to.

Each issue takes us one step closer to completing a fully rigged alien character and in this issue we tackle the face. We really look forward to seeing all of your animations so feel free to post them in the animation section of the 3DTotal Forums. Richard Kazuo and Danilo Pinheiro will continue to instruct us in Maya and Luis San Juan Pallares will be leading the way in 3ds Max.

With this feast of tutorial content all we need now is a gallery showing some of the best 3D artwork around today and this month's issue doesn't fail to deliver with excellent work from Guillaume Cerdan, Marcos Nicacio, Daniil V. Alikov and many more.



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What's in this month?



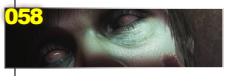
Maarten Verhoeven
3D Character Artist



The Gallery
10 of the Best 3D Artworks



Stylized Toon Animal
Chapter 3: texturing



Mudbox Female
Character Creation Chapter 4: Zombie



Introduction to Rigging
Chapter 5: Facial Rigging



"Max and Milton"
Project Overview by Jason Baldwin & Joe Beckley



"Open Green"
Digital Art Masters: Volume 4 – Free Chapter



Indoor Lighting
Series for 3ds Max MR & V-Ray, Maya & Cinema 4D



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Free Stuff!

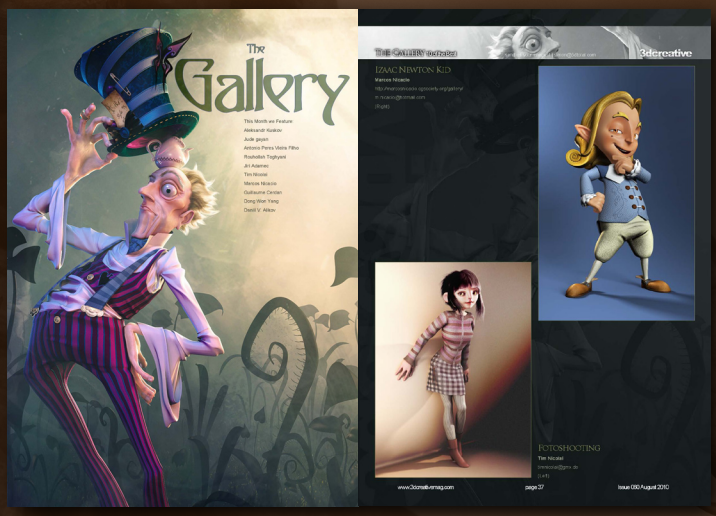
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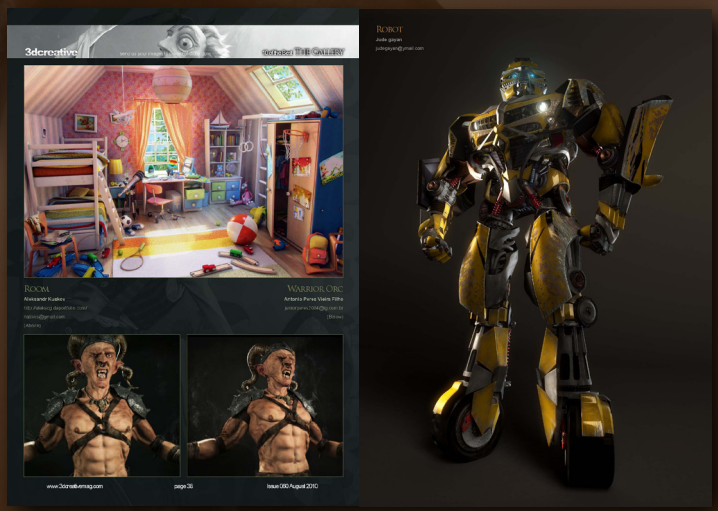


Get the most out of your Magazine!

If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!









Setting up your PDF reader

For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the View menu, then Page Display;
3. Select Two-up Continuous, making sure that Show Cover Page is also selected.

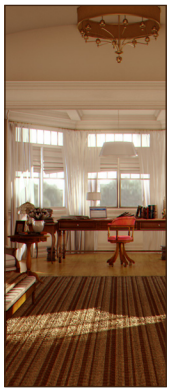
That's it!

CONTRIBUTING ARTISTS

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in 3DCreative magazine, please contact: simon@3dtotal.com

ENVIRONMENT LIGHTING INDOOR SCENE

Chapter 2 of our new Environment Indoor Lighting tutorial series with a great lineup of talented artists: **Jamie cardoso** (**3ds Max + MR**), **Viktor Fretyán** (**3ds Max + Vray**), **Luciano Iurino** (**Maya**) and **Fredi Voss** (**Cinema 4D**).





VIKTOR FRETYAN



Viktor Fretyan is an architect working on his diploma project whilst working as a freelancer. Viktor is doing mostly architectural renders and has never really tried out at any other fields of 3d yet. Viktor also has a passion for movies and maybe at some point will try working on VFX.

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LUCIANO IURINO

Started back in 1994 with 3d Studio on MS-Dos as a modeller/ texture artist. In 2001 he co-founded PM Studios (an Italian videogame developer) with some friends, and still works for it as the lead 3D artist. He also works as a freelancer for different magazines, web-portals, GFX and videogame companies, and recently he left the 3ds Max environment to move on to XSI.

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FREDI VOSS



Living and working as a fine artist and 3D freelancer in Germany, Fredi – a.k.a. rollmops – can often be found on the various web communities, where he has also won several awards. His client list includes Audi and Siemens, and he also has as Animago Award and a Fine Art degree under his belt!

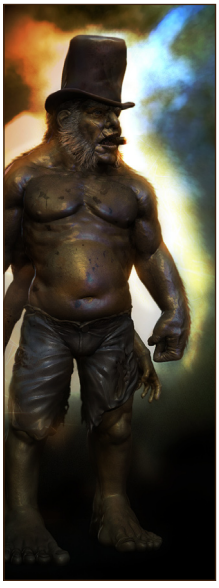
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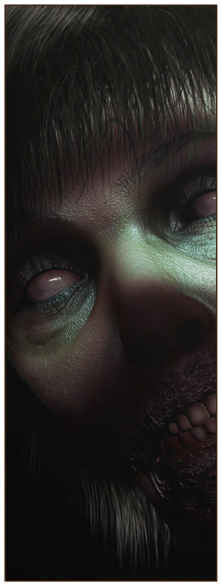


MAARTEN VERHOEVEN

Maarten Verhoeven is a freelance CG artist living in Belgium, with a passion for anatomy, monsters and toys. Maarten has a master degree in animation, but his first love is modeling, sculpting and recreating creatures.

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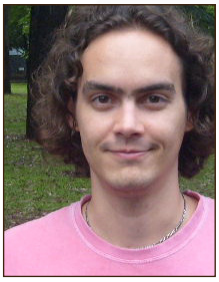




WAYNE ROBSON



is a freelance digital artist who has taught Mudbox around the world and has been asked to lecture at the Vienna science academy. He is the programmer behind 'MudWalker' and the mental ray shader for vector displacement using Mudbox maps. currently he's works as a CGI supervisor for Project 2813. He owns Mudbox Hub and PsychoCore Software. www.dashdotslash.net
wayne@dashdotslash.net

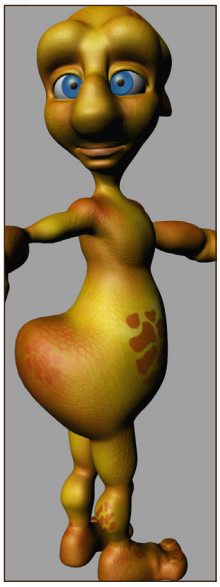


DANILO PINHEIRO

Danilo Pinheiro is a Brazilian with a Physics degree from UFMG. He worked for 5 years as a 3D generalist in films, advertising, arts, HQ, video clips, TV series, etc. After that, he is working as a Character TD, because he enjoys solving problems.

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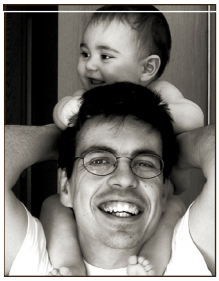


LUIS SAN JUAN PALLARES



My name is Luis San Juan, I am a freelancer with over 9 years CG experience. I have worked as a character setup supervisor and created tools for the studios I worked at, such as Nexus Productions, Keytoon Animation Studios, Ilion Animation Studios and the Mill.

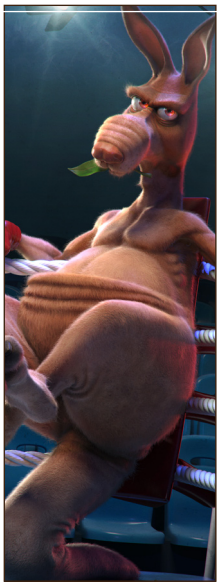
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JOSE ALVES DA SILVA

Jose Alves da Silva has been working in the 3D field for over 15 years. Jose started working mainly in Architectural visualization. Jose works as a full time freelancer dedicated to character creation and illustration. This has given Jose the opportunity to work on some spectacular projects in the feature film, advertising and gaming industries.

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RICHARD MAEGAKI



Born in Brazil, Richard Maegaki studied at Melies School of Cinema and Animation where he discovered a passion for rigging. After a brief time at Casablanca Animation as a Character Rigger, Richard was hired at Vetor Zero/Lobo and is working there as a Lead Character TD since 2007.

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richardyzo@gmail.com



JOE BECKLEY

Showcasing a diverse background in the commercial and feature film industry, Joe offers 10+ years of expertise ranging from texturing and lighting to matte painting and art direction. Joe has his own animation and design studio, Jargon Studios, and has since brought his skill set to several major studios including DisneyToon Studios, Cartoon Network, Warner Brothers, and LAIKA Inc.

www.joebeckley.com | mail@joebeckley.com



WOULD YOU LIKE TO CONTRIBUTE TO 3DCREATIVE OR 2DARTIST MAGAZINE?

We are always looking for tutorial artists, gallery submissions, potential interviewees, 'making of' writers, and more. For more information, please send a link to your portfolio, or send examples, to: simon@3dtotal.com

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MAARTEN VERHOEVEN



Maarten Verhoeven is a 3D artist who specializes in character sculpting and has a passion for film and monsters. He has been working in the CG industry across a number of different fields, which incorporate both film and TV, but is looking to focus his attention on sculpting.

"ONCE YOU KNOW THE TOOLS, THE TECHNICAL ASPECT ENDS AND THE CREATIVE PROCESS STARTS."

INTERVIEW WITH MAARTEN VERHOEVEN



In your CG portfolio you state your passion for 3D sculpting and anatomy, but you have had a few years experience in other sectors of the industry. Can you tell us a little about your previous jobs and how your interest in sculpting developed?

As long as I can remember, I've been holding pencils, crayons and white paper, accompanied by hours of monster films. So when I turned twenty I went to art school. It taught me absolutely nothing except figure drawing and basic anatomy. I always wanted to create creatures for movies and the best alternative I could find over here in Belgium was to study Animation. I got a masters degree and went looking for a job. Finding a job wasn't easy but eventually I found a place and I have been working there every since as the only 2D/ 3D generalist. In a few words this covers storyboarding, logo design, motion graphics online editing, color grading and small visual effects in both 2D and 3D.

I've always loved creating things on paper and in clay so I decided to pick up on an older passion. I went online and saw some pictures from other artists and thought: "Hey I want to make that!" So I found ZBrush and here we are one and a half years later.



Do you feel as though your grounding in figure drawing and anatomy has proven useful with regard to your character modelling in ZBrush, or do you believe a different course may have been more beneficial?

I believe observation is everything. Learning to see is one of the most important pillars for figure drawing. Try to understand what you're looking at in an objective way. Analyze the shapes and proportions and you'll see it all makes sense in your mind. The human eye and mind are very hard to trick or fool and errors will be picked up by any viewer.

You have numerous sculpts in your portfolio based upon film characters, but what do you look for when choosing your subject matter?

I love movies and their characters. For a long time, it was the only way to see weird characters act and move in an environment as a puppet

or in CG. What I look for in a film creature is very diverse, ranging from a wish to recreate it through to a purely technical understanding of why someone has created it that way. In my opinion you can only learn from the best CG and makeup artists like Rick Baker, Jordu Shell, Scott Patton and hundreds of others that have inspired me. Often by studying their work and trying to recreate it with your own twists and turns you can learn how it's made, if you take time to look and study it.

As a keen fan of films which movies have impressed you with regard to the CG characters and why?

When I was a kid, I loved *Jurassic Park, The Abyss* and *Terminator 2: Judgement Day* but this was mainly because I couldn't guess how they did it. But in recent years the creatures in *King Kong* have really impressed me, particularly the ape animation which although being motion captured displays priceless facial emotions. *The Pirates of the Caribbean* series is another one for the diversity in the design of the zombie pirates and the sea-infested guys on the Dutchman. *Transformers*, *LOTR* and the *Harry Potter* series have their great moments and also made me feel like a kid again wondering "how did they do it?"











Do you think that part of the beauty and appeal of CG is in wondering about how it is achieved, or do you think it has more to do with reproducing something that is completely imaginary?

CG can be looked at in different ways, but one thing is sure: it will always be just a toolbox for an artist. Once you know the tools, the technical aspect ends and the creative process starts. It's hard to create good CG work. Even if they are simulations, you must be very skilled to make them work. I feel that's the beauty and appeal of CG from a technical aspect; it will be more appreciated by those who know how it's created. But a random viewer is a better judge looking at any concept or idea; he's not distracted by the technical baggage.









Can you describe your work methods and approach to sculpting and do you ever create a low poly mesh in LightWave before going into ZBrush?

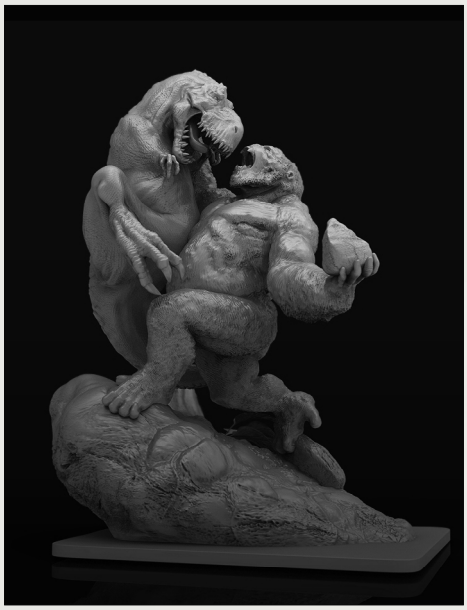
I don't draw with pencils or crayons anymore. I create the base concept in my head and search for a lot of references in art books and pictures on the web. I build a base mesh in LightWave or ZBrush and at this point I already know where I will make the mesh denser in order to get the details in later during the sculpting phase. I have some decent base meshes built in LightWave: full bodies and busts. I don't like to waste time during the creative sculpting process.

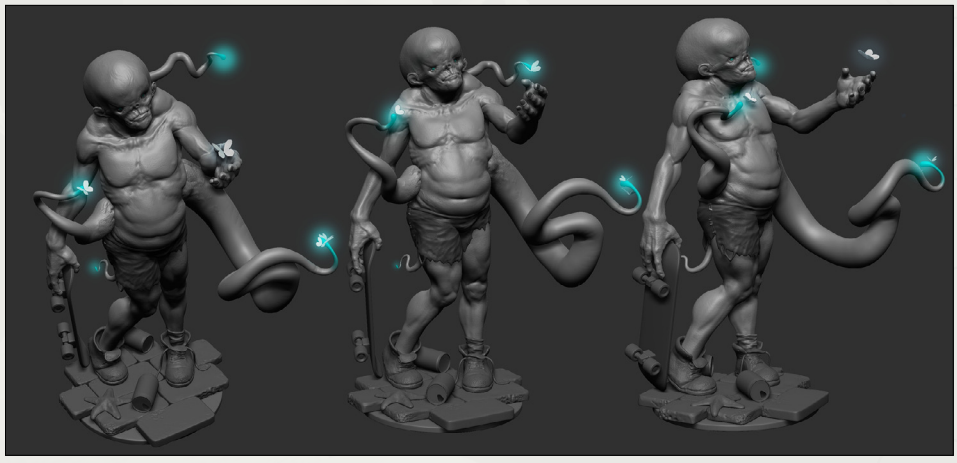
Do you ever make any clay maquettes of your models or indeed use this process to create 3D models?

I haven't used clay as reference for my maquettes; for me it slows down the process of creating. I have a feeling that this will disappear in the end like make-up effects, and it will all evolve to digital. A lot of sculptors are leaving the classic materials behind and giving digital a try and I hope that they can find the real world feeling of analog materials in the CG realm.

ZBrush has revolutionized the way character modelers work, but how do you see software developing over the coming years and what improvements would you welcome?







I think that the creators of ZBrush have open and good communication with their artists, and with every new version they seem to add new features that nobody has thought about, but once you use them you can't do without them. I hope that painting in layers and giving sub layers blending and additional material properties will be a new feature. I think that the new GoZ feature will be a great way of leaving much of the technical stuff behind like prepping maps and making the setup in third party software for rendering. Also the Z render engine



is very strong but it could always improve with more specular, transparent, glossiness and reflection options.



Of all your pieces which rate amongst your favorites and why?

Most of the time my latest work is my favorite, and I think it will always be like this as long as I can see progress in my own work during the sculpting phase or the final composite renders. I could name some pieces like Centaur, Gorilla King or Mr. Wink as favorites because of the reactions I got from them.

The Centaur is a quite dynamic and complex marriage of anatomical features. What were the most challenging aspects of this project?

I created this work almost a year ago, and I think I have learned a lot since then. The most challenging part of this piece wasn't the anatomy, it just felt right. I think that the attitude was more important than the anatomy in this case. I wanted to give it the impression of being big, strong and heavy, and that is often forgotten in a lot of work as most of the time you'll see

emotionally empty T-poses. I always have an urge to give the viewer a pose, look or emotion, even if it's a bust. I try to add something to the character of the figure, even if it's very subtle. During the sculpting phase you'll already know how it should move and live in an environment if it ever got the chance to run free in a game, movie or animation.



If you had the chance to work on any project what would it be?

I would like to work on almost any big AAA projects, where I could learn and work with other artists, to exchange ideas. My preferred department would be pre-production or concept design of digital maquettes for toys (collectibles) or film. I love sculpting, design and posing, but textures and animation aren't important to me.

Thanks for taking the time to talk to 3DCreative!

Thanks, it's always nice to hear you have a following. Sculpt on!

MAARTEN VERHOEVEN

For more work by this artist please visit:
http://mutte.cgsociety.org/gallery/
Or contact them at:
darth_mutte@yahoo.com
Interviewed by: Richard Tilbury







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OUT NOW!



The Gallery

This month we feature:

Aleksandr Kuskov

Jude Gayan

Antonio Peres Vieira Filho

Rouhollah Toghyani

Jiri Adamec

Tim Nicolai

Marcos Nicacio

Guillaume Cerdan

Dong Won Yang

Daniil V. Alikov

IZAAC NEWTON KID

Marcos Nicacio
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(Right)





FOTOSHOOTING

Tim Nicolai
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(Left)



Room

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Warrior Orc

Antonio Peres Vieira Filho
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Jiri Adamec 2010
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Mad Hatter

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FOLLOW THIS TUTORIAL SERIES ON PAGE 104

Environment Lighting

This five part series will focus on the topic of setting up a variety of lighting rigs that reflect natural lighting at different times of the day and manmade interior lighting. Each of the chapters will use the same base scene as a starting point, and will show a step by step guide to finding a lighting and rendering solution that best reflects the desired lighting situation.

The tutorials will explain the type of lights used and how to set up the parameters along with talking about the different methods of tackling the subject. The manipulation of textures may also be covered in order to turn a daylight scene into night scene for example, as well as a look at some useful post production techniques in Photoshop in order to enhance a final still.

Follow

This month our artists will show you how to turn our seemingly boring scene into a truly atmospheric environment with the third chapter covering Artificial Light.

So if your interested in seeing the third chapter of this amazing series, please flip to the back of this magazine and enjoy.

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- 3DSMAX + V-RAY | PAGE 116
- CINEMA 4D | PAGE 122
- MAYA + MENTAL RAY | PAGE 128

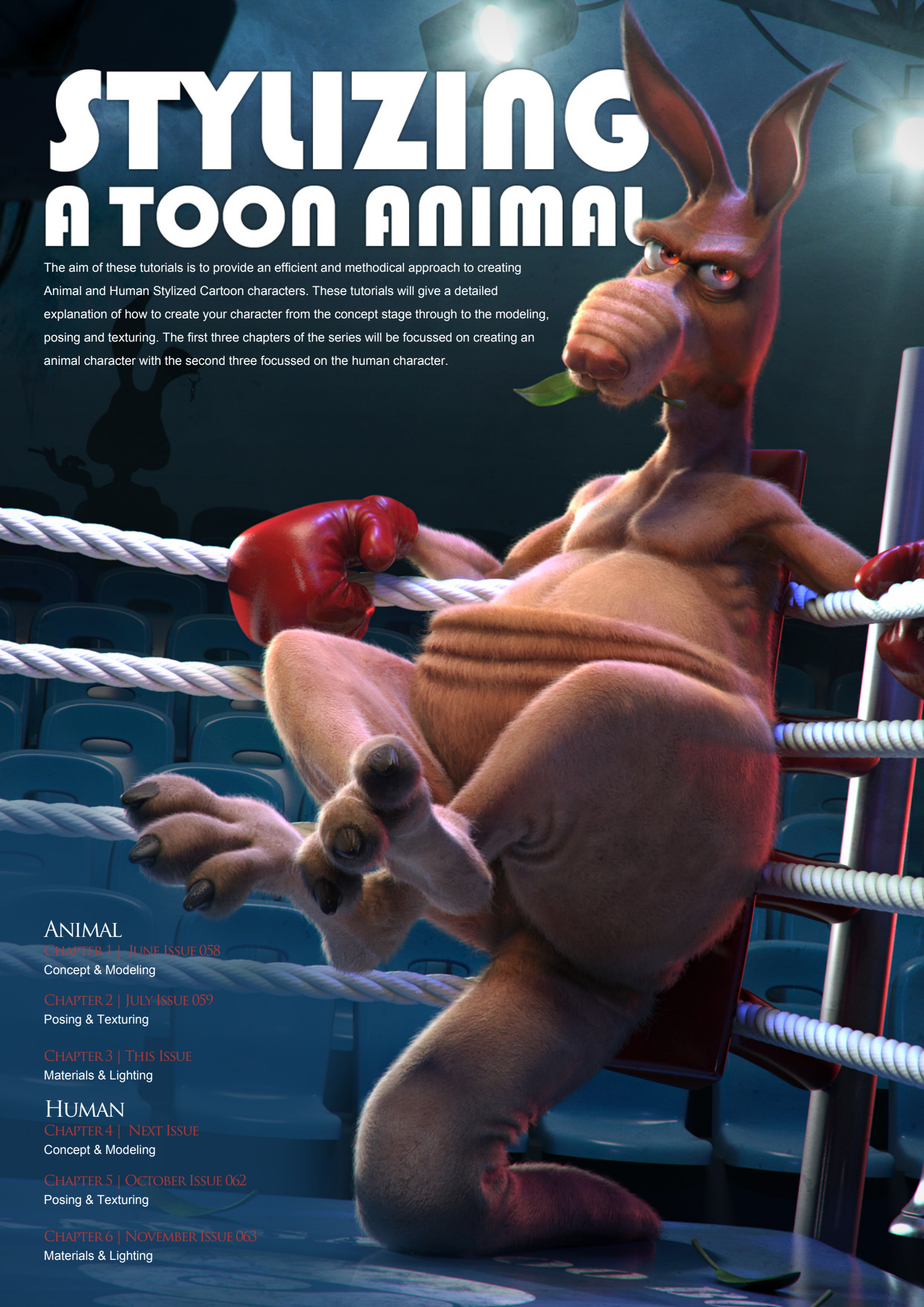






STYLIZING A TOON ANIMAL

The aim of these tutorials is to provide an efficient and methodical approach to creating Animal and Human Stylized Cartoon characters. These tutorials will give a detailed explanation of how to create your character from the concept stage through to the modeling, posing and texturing. The first three chapters of the series will be focussed on creating an animal character with the second three focussed on the human character.



Animal

Chapter 1 | June Issue 058
Concept & Modeling

Chapter 2 | July Issue 059
Posing & Texturing

Chapter 3 | This Issue
Materials & Lighting

Human

Chapter 4 | Next Issue
Concept & Modeling

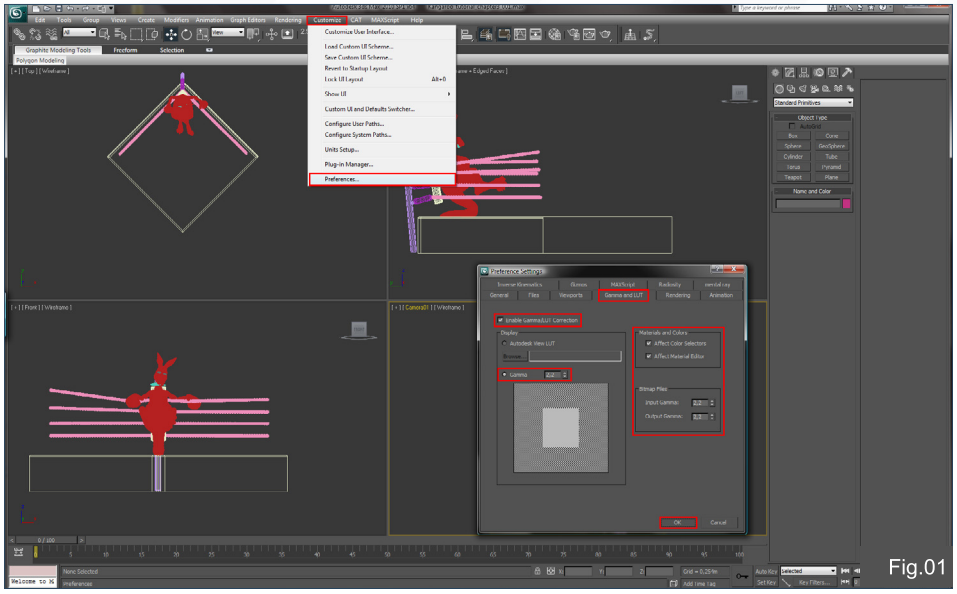
Chapter 5 | October Issue 062
Posing & Texturing

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Materials & Lighting

How to Stylize and Model 'Toon Animals' Chapter 3 - Materials & Lighting

Software used: 3ds Max & ZBrush

In Chapter 2 we set our character in a pose that shows the viewer its personality. We also created the main textures for the character. In this final chapter, we will deal with the lighting and materials. Some more textures will also be created in order to enhance the other materials' appearance.


Fig.01

Light

Even though we are lighting a cartoon character, sticking to some real world rules regarding the light is a good principle. As you probably already know the images we see on our monitors are color corrected with a gamma value. This correction interferes with the way the luminance is displayed and the images we see do not reflect the way the lights are really acting in space. So, the way to correct that is to remove that gamma correction so that we can work in Linear mode.

If you are new to this, don't worry about the fact that the Material Editor slots background gets lighter and the fact that the color picker gradients look different.

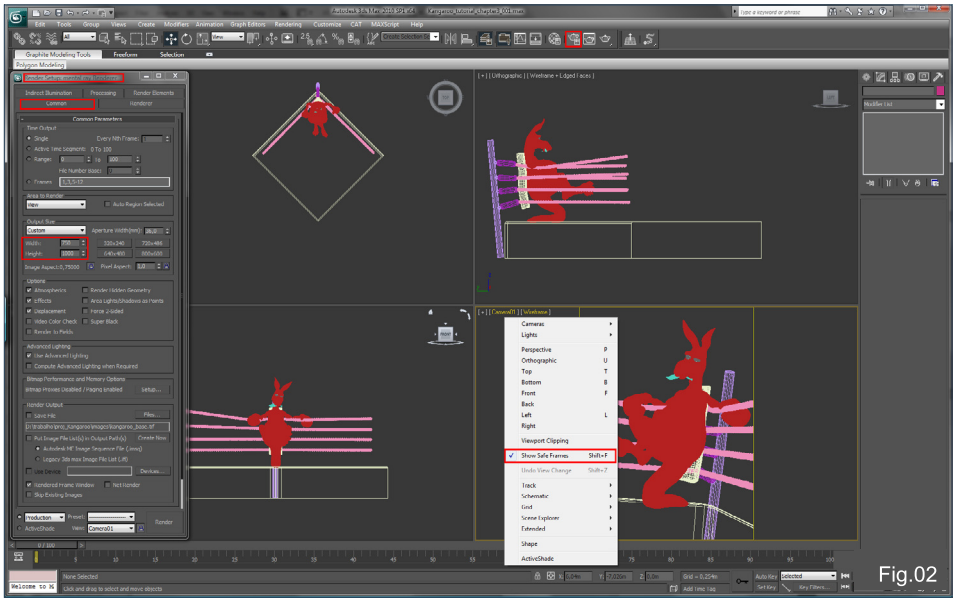
When working in Linear mode it is also important that lights behave as they do in real life. Light decays at the inverse square of the distance, so you will see me turning on this parameter in most lights. If you are new to working in Linear mode you will also be surprised with the intensity values used for the lights, which are much higher than the ones used without light decay.

Why all this? Because the lights will behave like they do in reality and we will also perceive them as in reality.

Gamma correction (**Fig.01**)

Let's start by correcting the gamma.

- In 3ds Max, inside the Customize menu choose Preferences.
- In the Preference Settings window choose the Gamma and LUT tab.
- Turn on the Enable Gamma/LUT Correction.
- Make sure the Gamma value is 2.2
- Turn on Affect Color Selectors and Affect Material Editor.
- Make sure the Input and Output Gamma values are 2.2
- Press OK.


Fig.02

Set the proportions (**Fig.02**)

The way we view the character is as important as his attitude and pose. It will help to define the character and his relationship with the viewer. I have chosen to place the camera at a low point of view so that the kangaroo looks more menacing. I have also chosen to frame the composition in a portrait format because the kangaroo is taller and it will help the character fill the image.

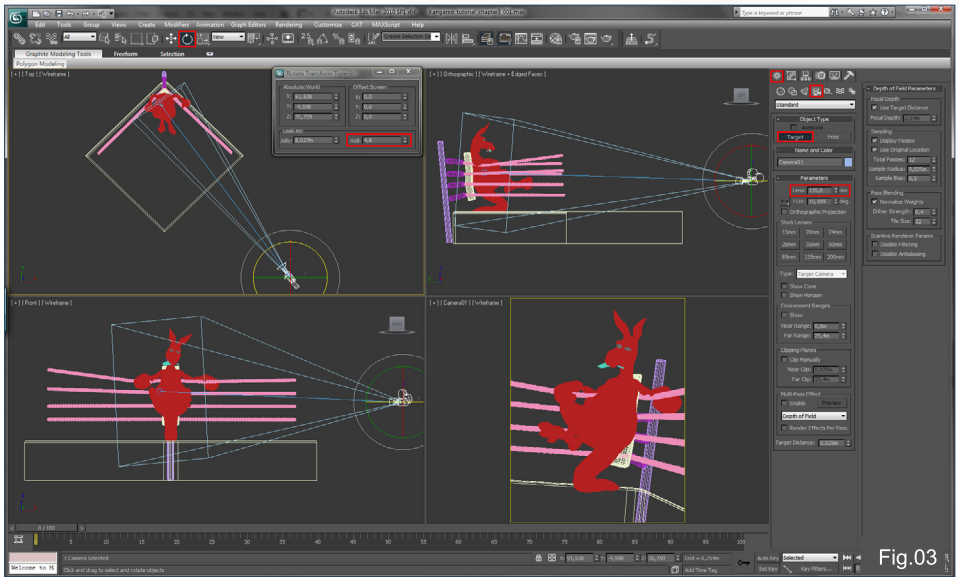
To set the image format follow these steps:

- Press F10 to open the Render Setup window.
- In the Common tab, in Output Size, set the Width value to 750 and the Height value to 1000 pixels.
- Close the Render Setup window by pressing F10 again.

- Choose the lower right viewport and press Shift + F to show the safe frame. This way the view port will be cropped with the same proportion of your image render.

Create the Camera (**Fig.03**)

- From the Create tab, choose the Camera icon.
- Choose the Target button (to create a target camera).
- On the Top viewport click and drag to place the camera.
- On the lower right view port press C, in order to see the camera view restricted by the safe frame.
- Use the Top, Left and Front viewports to select and move the camera. If you wish to follow my point of view try to place it as in the image.
- I have used a lens value of 135 mm. You can change it under the Parameters of the camera. I have also decided to twist the camera a bit to give more dynamism to the image:
- Select the camera.
- Right click on the Rotate Transform icon on the top row.

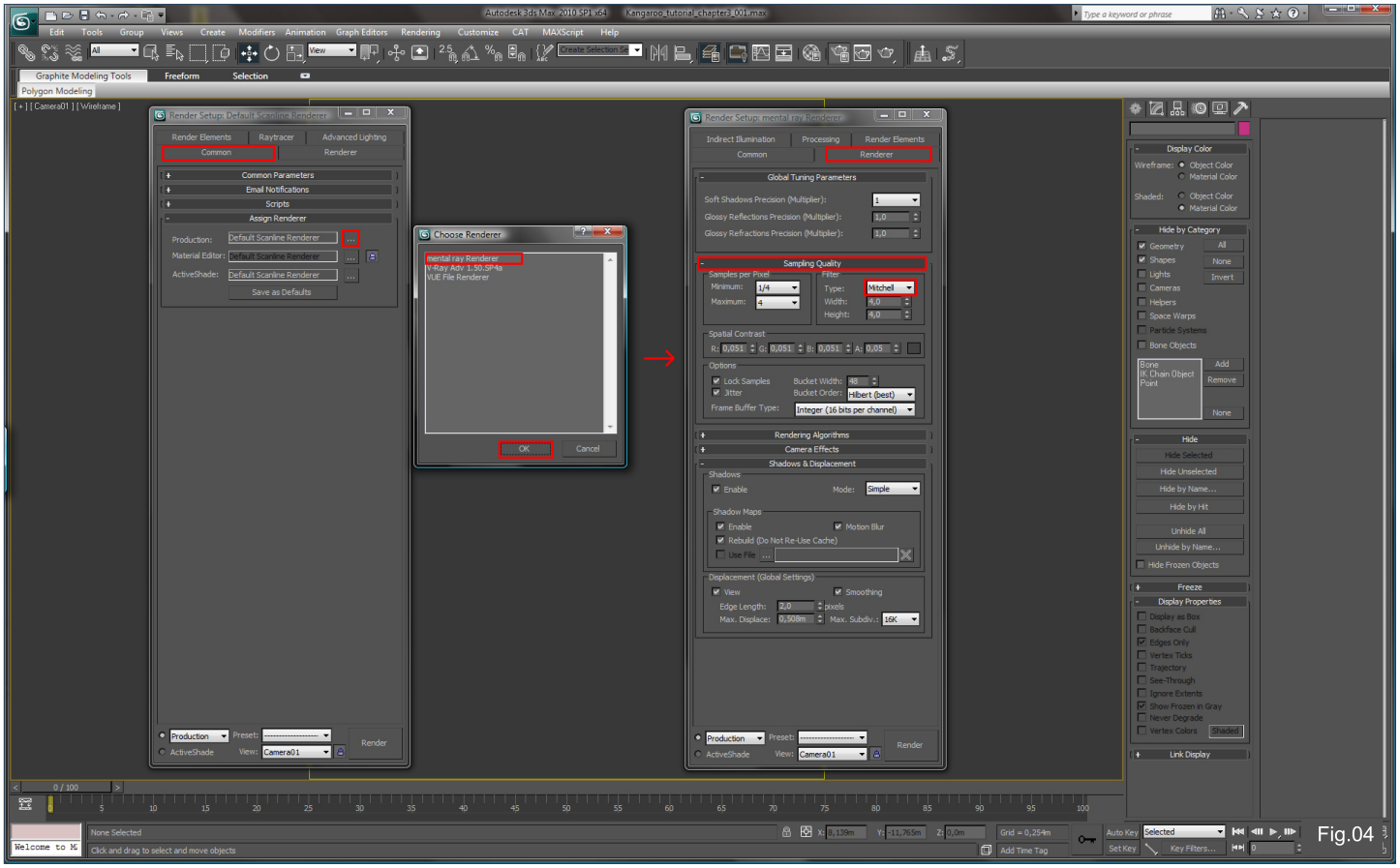

Fig.03

- In the Rotate Transform Type-In window that opens, insert a Roll value of 4.6.
- Close the window.

Set Mental Ray (**Fig.04**)

We will use the Mental Ray render engine and will leave most of the default settings. Let's activate the render engine and adjust the anti aliasing settings:

- Press F10 to open the Render Setup window.
- In the Common tab, click on the Assign Renderer drop down menu.
- Click on the "…" button in front of Production.
- Choose mental ray Renderer.
- Press OK.
- Click the Renderer tab.
- In the Sampling Quality pull down menu change the Filter Type to Mitchell. I like the

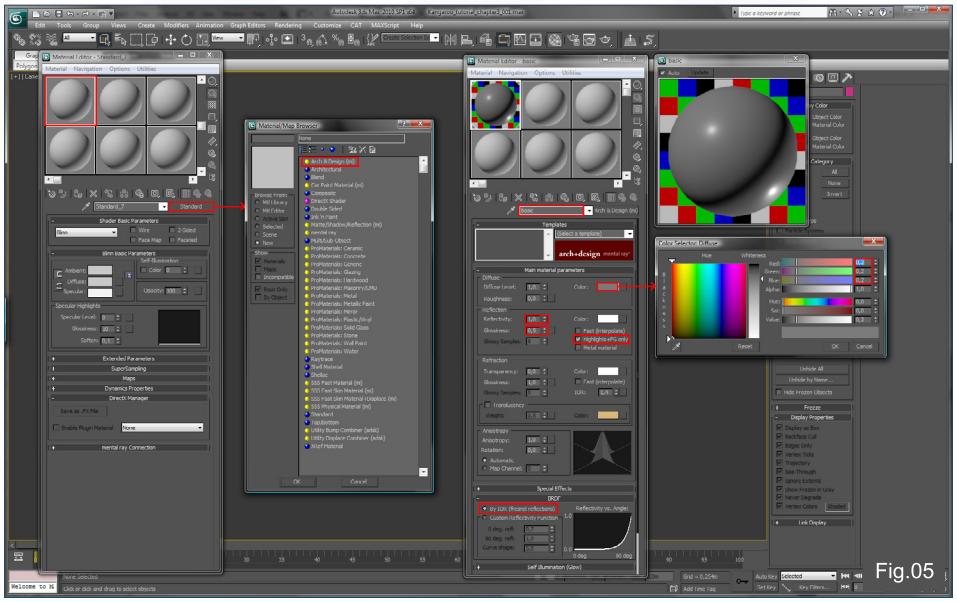

Fig.04

sharpening effect of this filter, but you can choose another if you prefer.

Create Basic Material (**Fig.05**)

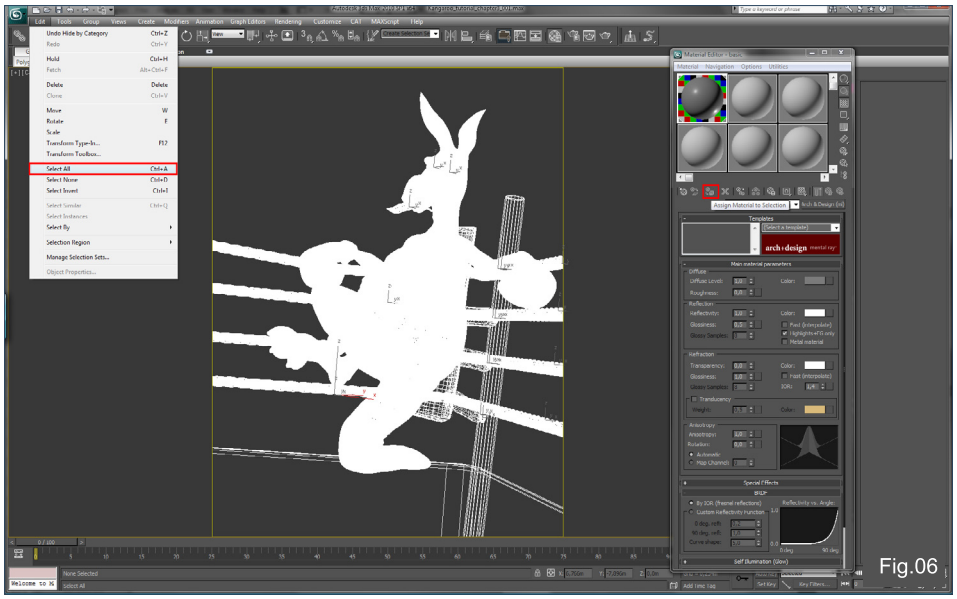
We will create a basic gray material that will be applied to the whole scene, so that we have mental ray materials everywhere.

- Press M to open the Material Editor.
- Choose one material slot.
- Click on the Standard button to choose a different type of material.
- From the list pick the Arch & Design (mi) shader.
- Name the material "basic"
- Click on the Diffuse color swatch and change the color to R:0.2,G:0.2, B:0.2
- Change the Reflectivity value to 1.0
- Change the Glossiness value to 0.5
- Turn on the Highlights + FG only option, so that mental ray doesn't render any reflections on this material.
- In the BDRF pull down menu choose the By IOR (fresnel reflections) option.


Fig.05

Apply Basic Material (**Fig.06**)

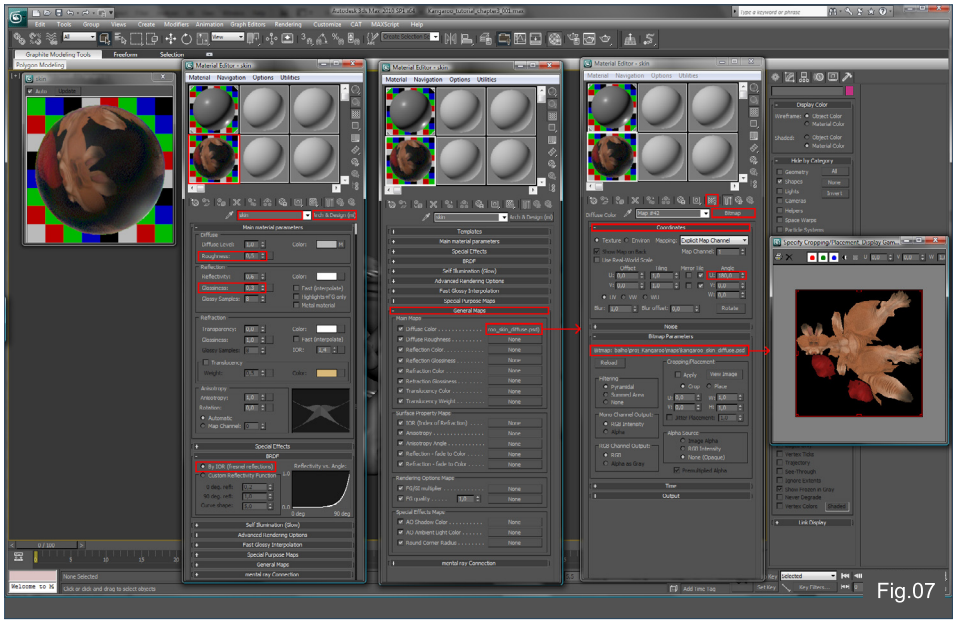
- Select all the objects in the scene by pressing Ctrl + A.
- In the Material Editor, press the Assign Material to Selection button.
- Press M to close the Material Editor.


Fig.06

Skin Material (**Fig.07**)

We will create a basic skin material with the texture we have made in Chapter 2.

- Create a new Arch & Design (mi) shader in a new Material Editor slot (repeat the first four steps of **Fig.05**).
- Name the material "skin".
- Change the Roughness value to 0.5.
- Change the Reflection Glossiness to 0.3.
- In the BDRF pull down menu choose the By IOR (fresnel reflections) option.
- In the General Maps pull down menu, click on the Diffuse Color slot.
- Choose Bitmap from the list.


Fig.07

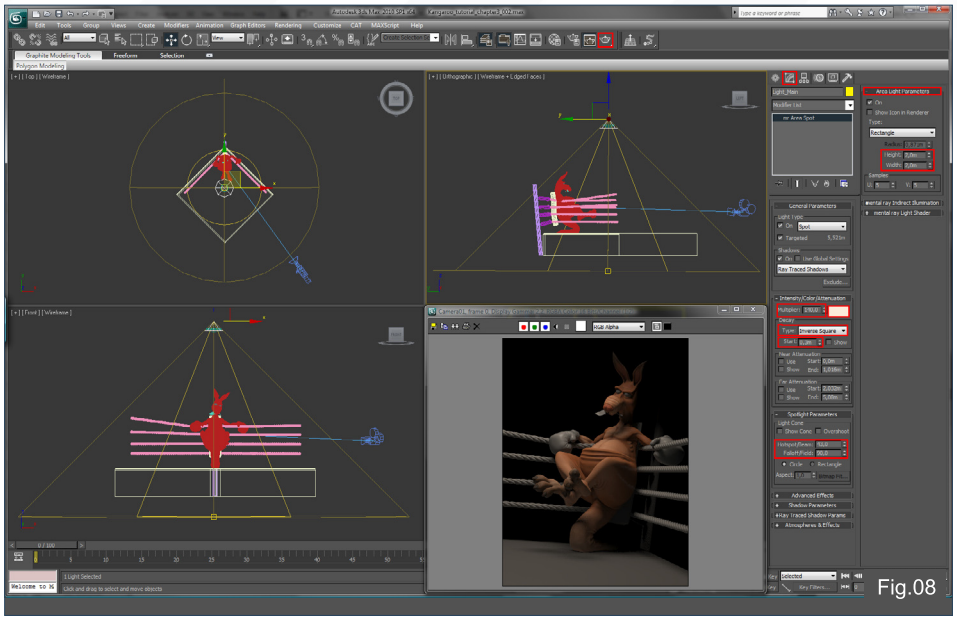
- Pick the "kangaroo_skin_diffuse.psd file" created in Chapter 2.

ZBrush interprets UV coordinates in a different way to Max, to fix that we have to flip the image vertically. To do that inside 3ds Max do the following:

- In the Coordinates pull down menu change the U value of the Angle to 180. This will rotate the image 180 degrees around its X axis, flipping it vertically.

NOTE: You can also flip the image vertically in Photoshop before importing it, instead of flipping it in 3ds Max.

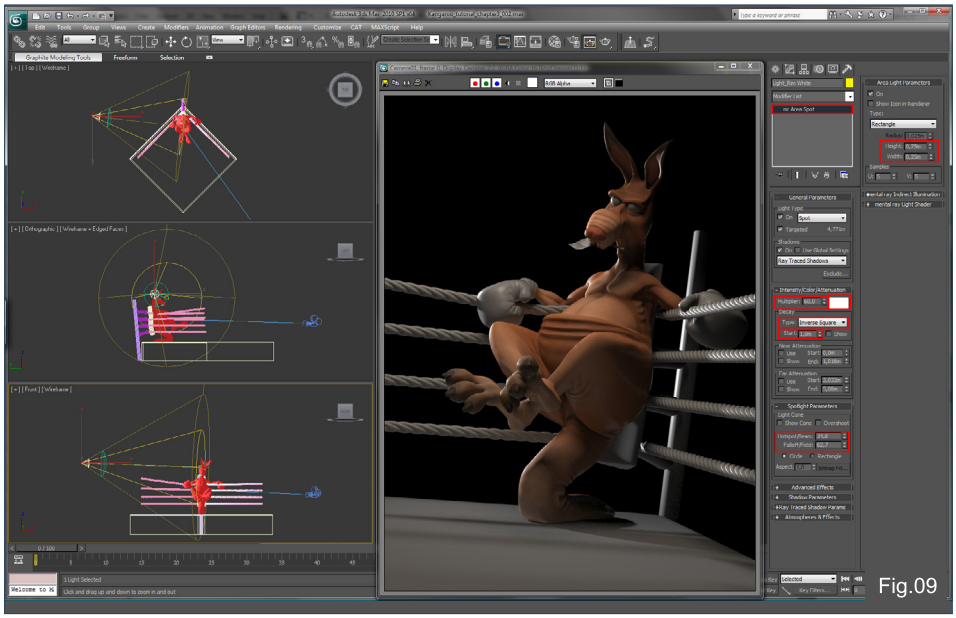
- Select the kangaroo body object and apply the skin material to it.
- Click the Show Standard map in Viewport button if you wish to see the map applied to the model in the shaded view port.


Fig.08

Main Light (**Fig.08**)

Let's start to light our model. We will first create our main light, which is the one that comes from above and illuminates the boxing ring.

- From the Create panel on the right, click on the Lights button.
-Click on Photometric and change to Standard lights, click on the mr Area Spot button..
- Click and drag in one of the view ports to create a new light.
- Try to position the light closely to the position in the image.
- Click on the Modify tab on the right panel to edit the light's properties.
- In the Intensity/Color/Attenuation menu change the Multiplier to 140.
- Set the light color to a light warm orange (R:251, G:216, B:179).
- Change the Decay Type to Inverse Square.
- Change the Start distance to 0.3 meters. This means that the light will be constant until 0.3 meters and will start to fade in the inverse square of the distance from there.
- In the Spotlight Parameters I have set the Hotspot to 43 and the Falloff to 90. The objective was to have the character's head in the transition area between light and dark, so that it looks more menacing when we highlight the eyes.
- In the Area Light Parameters set the area Height and Width to 2.0 meters.
- Press F9 to render.
- See the results and adjust to your liking.


Fig.09

NOTE: The parameters regarding the Intensity Multiplier and the Start value are very sensitive. With an inverse square decay, the light is very strong as it leaves the source but it fades quickly on a first phase and then fades really slowly on the last part. As you will see, a small difference in the distance of the light affects the illumination a lot. The key is to be patient when positioning the lights to get the best lighting.

Rim Light 1 (**Fig.09**)

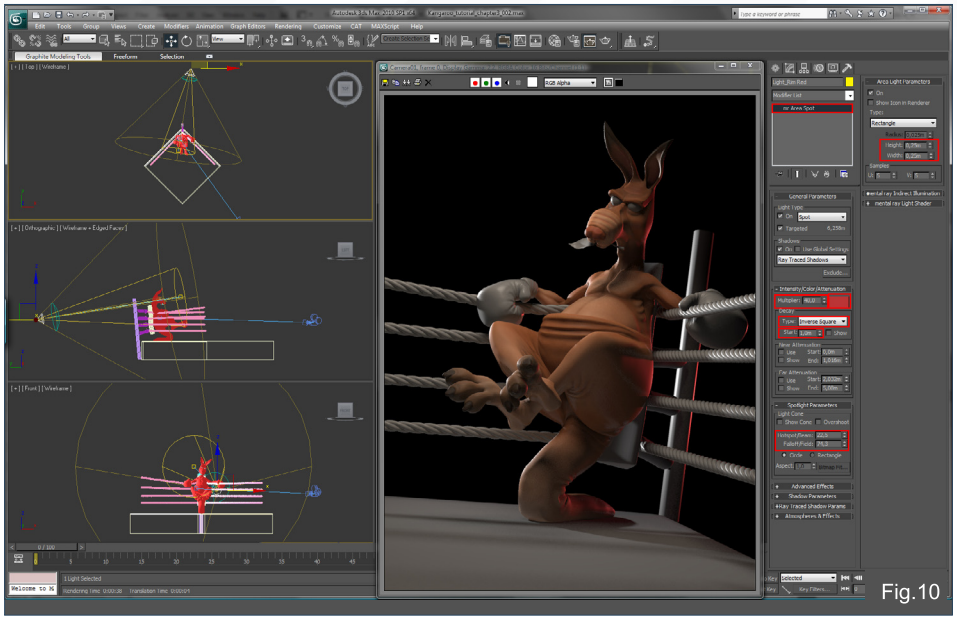
Let's create a white rim light on the left to bring out our kangaroo's silhouette.

- Create a new mr Area Spot light.
- Place it on the left side of the image coming from the back of the character (as in the image).
- In the Intensity/Color/Attenuation menu change the Multiplier to 60.

- Set the light color to white (R:255, G:255, B:255).
- Change the Decay Type to Inverse Square.
- Change the Start distance to 1 meter.
- In the Spotlight Parameters, set the Hotspot to 34.8 and the Falloff to 62.7.
- In the Area Light Parameters set the Height and Width to 0.25 meters.
- Press F9 to render and adjust.

Rim Light 2 (**Fig.10**)

Let's create a red rim light on the right side to define his silhouette on the other side, too.
I have picked red to add to the menacing factor.


Fig.10

- Create a new mr Area Spot light.
- Place it slightly to the right and coming from the back of the character (as in the image)
- In the Intensity/Color/Attenuation menu change the Multiplier to 40.
- Set the light color to red (R:128, G:8, B:8).
- Change the Decay Type to Inverse Square.
- Change the Start distance to 1 meter.
- In the Spotlight Parameters, set the Hotspot to 22.5 and the Falloff to 74.3.
- In the Area Light Parameters set the Height and Width to 0.25 meters.
- Press F9 to render and adjust from there.

Background (**Fig.11**)

Blue and red are present in boxing language: there are the red and blue corners, red boxing gloves, etc. I have decided that these two colors should be the base of my composition.

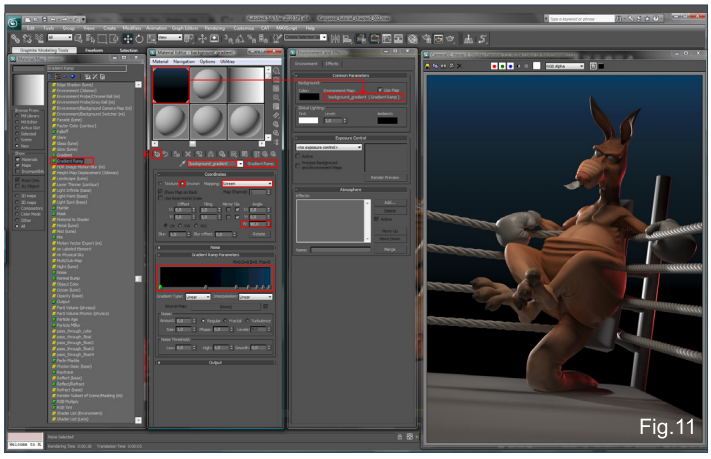
Let's create a dark background, as it is expected in a boxing arena, and which "simulates" a volume light coming from above, as in a smoky environment, by using a gradient map.

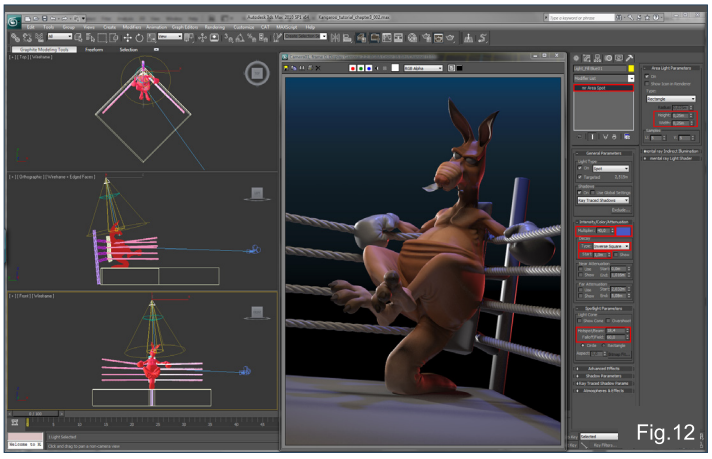
- Open the Material Editor (press M).
- Pick an empty material slot.
- Click the Get Material button.
- Choose Gradient Ramp.
- Name it "background_gradient".
- In the Coordinates area, choose Environment and make sure the Mapping is in Screen mode, so that the gradient will fill the background.
- Set the W value of the Angle to 90, to rotate the gradient.
- In the Gradient Ramp Parameters double click the arrows below the gradient to set their color. To create new arrows, click in an empty area inside the gradient. Build a gradient starting in black on the left side and ending in a dark blue on the right side. Create intermediate colors to define the gradient as you like.
- Press F8 to open the Environment window.
- Drag the Material editor slot of the "background_gradient" to the Environment Map slot. Choose Instance as the copy mode when asked for it.
- Press F9 to render and adjust the gradient if necessary in the Material Editor.

Integration Light (**Fig.12**)

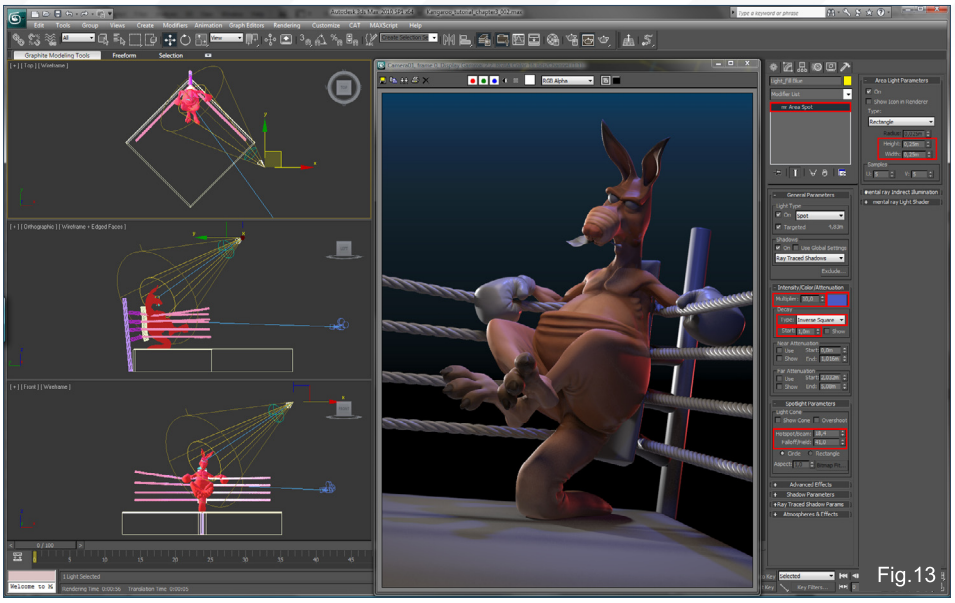
We will create a blue light coming from behind and above the character so that the foreground elements connect better with the blue background and so it suggests that the gradient is a "real" light source.

- Create a new mr Area Spot light.


Fig.11


Fig.12

- Place it above and from the back of the character (as in the image).
- In the Intensity/Color/Attenuation menu change the Multiplier to 40.
- Set the light color to blue (R:17, G:25, B:141).
- Change the Decay Type to Inverse Square.
- Change the Start distance to 1 meter.
- In the Spotlight Parameters, set the Hotspot to 18.4 and the Falloff to 60.
- In the Area Light Parameters set the Height and Width to 0.25 meters.
- Press F9 to render and adjust.


Fig.13

Fill Light (**Fig.13**)

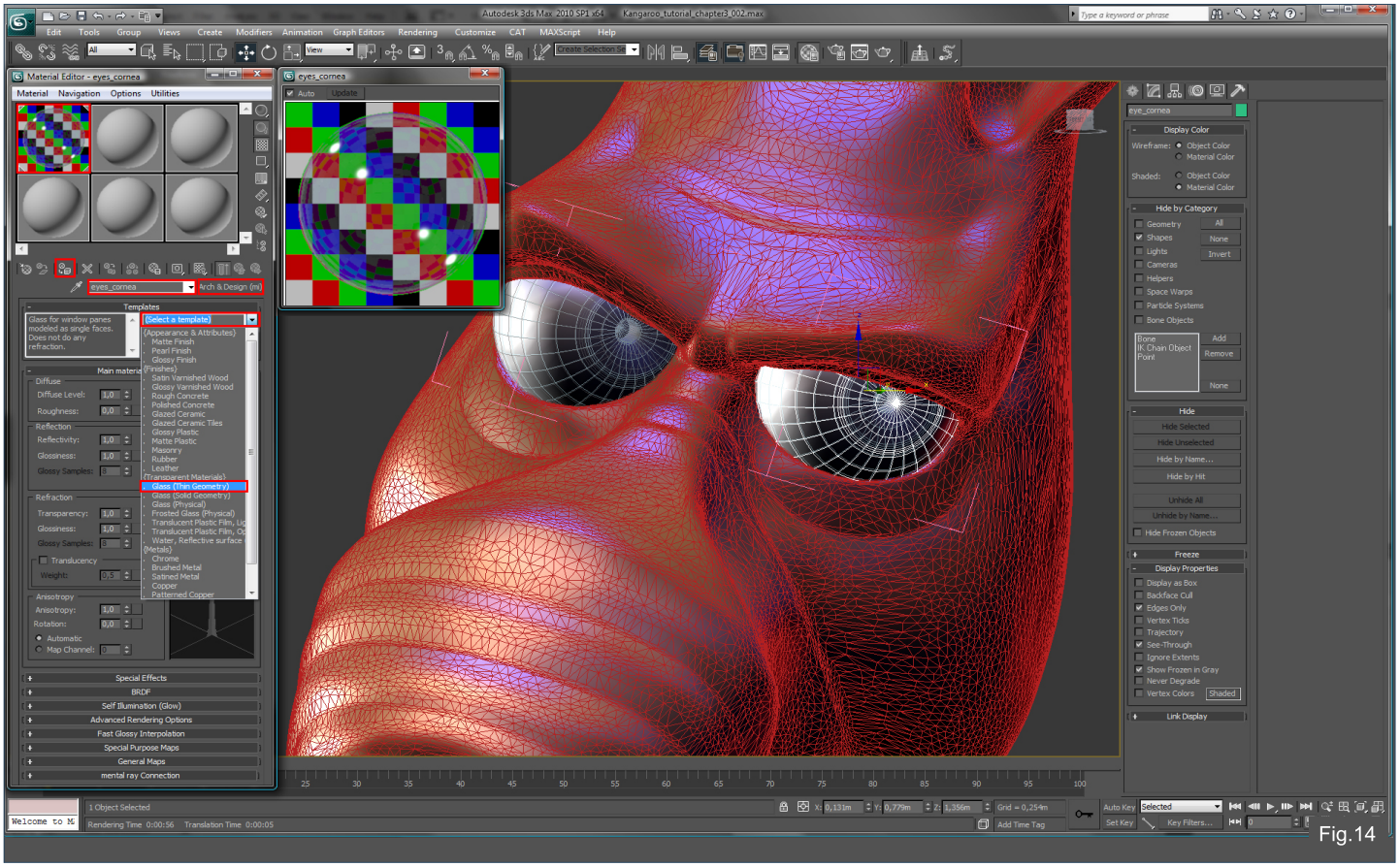
In order to bring some color to the shadows (and because we will be using blue for the boxing ring floor), we will create a weak blue light. It is a subtle difference, but it will help unite the scene.

- Create a new mr Area Spot light.
- Place it in front of the character and covering his darker areas (as in the image).
- In the Intensity/Color/Attenuation menu change the Multiplier to 10.
- Set the light color to blue (R:17, G:25, B:141).
- Change the Decay Type to Inverse Square.
- Change the Start distance to 1 meter.
- In the Spotlight Parameters, set the Hotspot to 18.4 and the Falloff to 41.
- In the Area Light Parameters set the Height and Width to 0.25 meters.
- Press F9 to render and adjust.

Eyes 1 (**Fig.14**)

The eyes are the most important part of your character. If they don't look alive, your character will look dead. Let's take care of the cornea first.

- In the Material Editor create a new Arch & Design (mi) material.
- Name it "eyes_cornea"
- In the Templates area click the menu that says


Fig.14

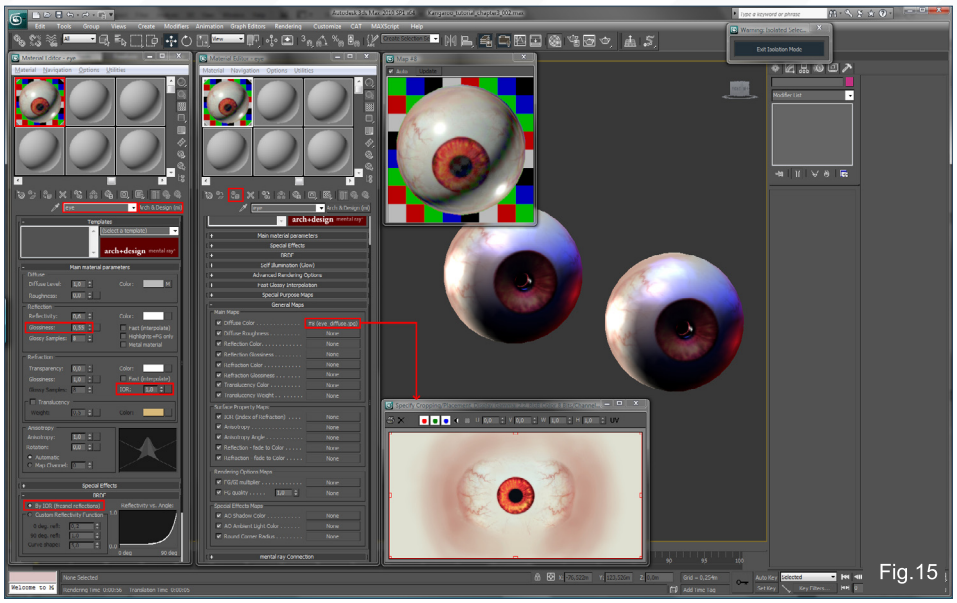
"(Select a template)".

- Choose the Glass (Thin Geometry) template.
- Select both of the kangaroo's eyes and open the groups.
- Select the "eye_cornea" object of both eyes.
- Apply the "eyes_cornea" material to them.

Eyes 2 (**Fig.15**)

And now, the eye interior:

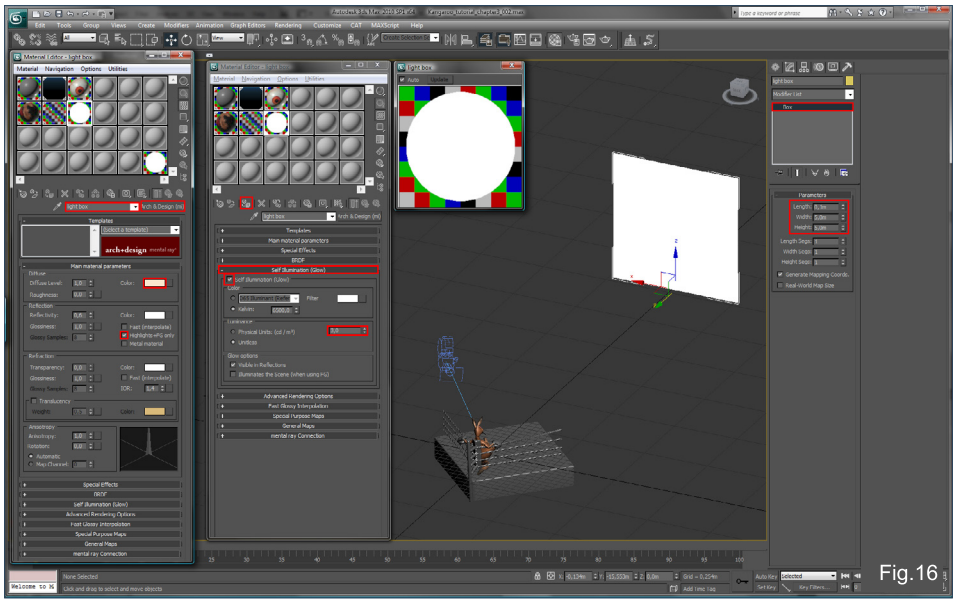
- Create a new Arch & Design (mi).
- Name it "eye".
- Change the Reflection Glossiness to 0.55.
- Change the Refraction IOR value to 1.8.
- In the BDRF pull down menu choose the By IOR (fresnel reflections) option.
- In the General Maps section, place the "eye_diffuse.jpg" texture we had created in Chapter 2 in the Diffuse Color slot.
- Select both eye ball objects and apply the "eye" material.


Fig.15

Eyes 3 (**Fig.16**)

We will use a simple studio trick to make the eyes more interesting. We will create a light box to be reflected by the eyes. First, let's create the material:

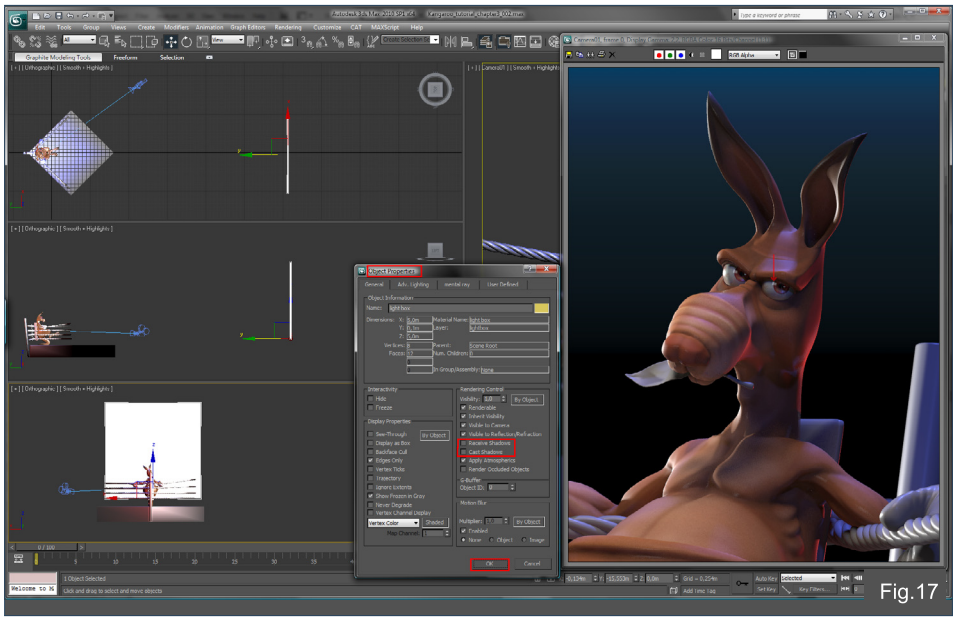
- Create a new Arch & Design (mi).
- Name it "light box".
- Set the diffuse color to a very light orange (R:0.976, G:0.812,B:0,635)
- Enable the Highlights + FG only toggle.
- In the Self Illumination (Glow) section turn on the Self Illumination toggle.
- Increase the Luminance units to 3.0.

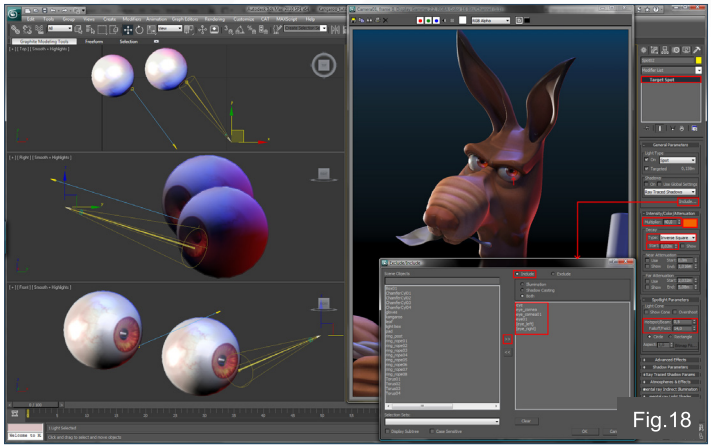

Fig.16

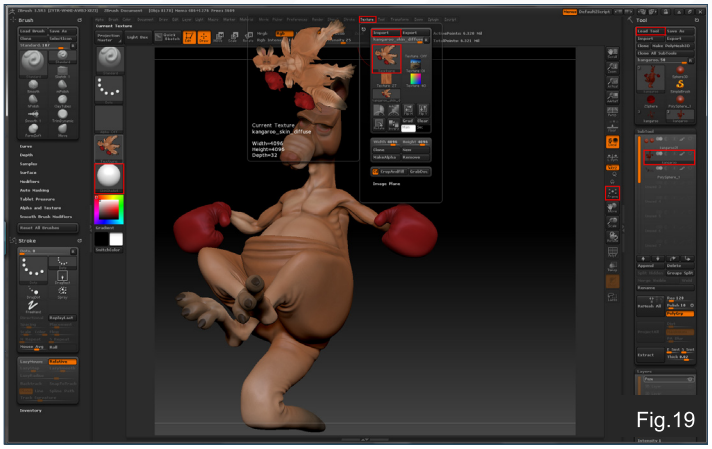
- Create a new box object with Length: 0.1m, Width: 5.0m and Height: 5.0m.
- Name it "light box".
- Apply the "light box" material to the "light box" object.

Eyes 4 (**Fig.17**)

- Move the light box so that it stands in front of the character and at a distance of about 16 meters from his face.


Fig.17


Fig.18


Fig.19

- Click on the "light box" with the right mouse button object and choose Object Properties.
- In the Object Properties disable Receive Shadows and Cast Shadows.
- Press OK.

I have made a nearer render to see the eyes better. Render and adjust the "light box" position to place the highlight on the eye covering part of the iris.

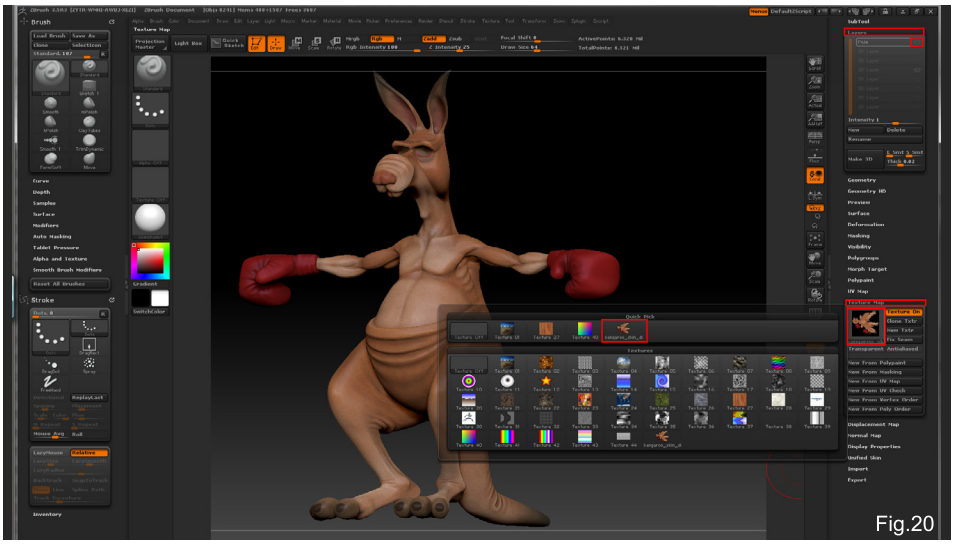
Eyes 5 (**Fig.18**)

In order to enhance the eyes' appearance a bit further, let's fake some highlights on the lower half of the iris. Let's start by creating a Standard Target Spot:

- Create a new Target Spot light from the Standard lights group. We are using a Standard light as we will not be needing shadows.
- Place the light very near to the eye (at about 0.16 m) and point it at the lower half of the iris (as in the image).
- In the Intensity/Color/Attenuation menu change the Multiplier to 40.
- Set the light color to orange (R:232, G:34, B:0).
- Change the Decay Type to Inverse Square.
- Change the Start distance to 0.02 meters.
- In the Spotlight Parameters, set the Hotspot to 0.5 and the Falloff to 14.

This is a fake light, so let's make it only affect the eyes.

- Press the Include button in the light settings.


Fig.20

- In the Exclude/Include window press the Include option.
- Select all the eye objects and eyes' groups on the left list.
- Press the ">>" button to pass those objects to the inclusion list on the right.
- Press OK

Now the light only affects the eye objects.

As the character has two eyes, we will make an instanced copy of the light to illuminate the other eye as well. The instance will allow you to fine tune the parameters for both eyes simultaneously. Keep both lights parallel.

- Select the light and its target.
- Shift + Drag the light to clone it.
- Choose Instance as a copy option.
- Move the light to illuminate the other eye's iris.
- Render and adjust.

Fur 1 (**Fig.19**)

We can push the representation of the fur a bit further, so we will create more textures to fill the other material editor slots and also enhance the diffuse texture we had painted. For this we will go back to ZBrush and use the ZAppLink plugin.

- Enter ZBrush.
- In the Tool menu choose Load Tool.
- Select the latest kangaroo tool you have saved before the decimation process (as asked for in **Fig,52** in Chapter 2).
- If you don't see the model on screen press F to frame your model on screen.
- Choose the kangaroo body subtool.
- Choose the SkinShaded4 material.
- In the Texture menu, press Import.
- Choose the "kangaroo_skin_diffuse.psd" file.

Fur 2 (**Fig.20**)

- In the Tool menu, under the Texture Map pull

down, click on the empty texture slot.
- Pick the kangaroo_skin_diffuse texture.
- Make sure you are at the same subdivision level where you created your layers. Otherwise you won't be able to access them.
- Disable the pose layer we had created (by clicking the eye icon in front of it), as it is easier to paint in a T Pose.
- Increase the subdivision level to the maximum number you had.

Fur 3 (**Fig.21**)
- Zoom in on the chest and upper belly area in a front point of view.
- Make sure that Photoshop is open before the next step.
- In the Document menu press ZAppLink.
- The ZAppLink Projection window will open.
- Press the Drop Now button.

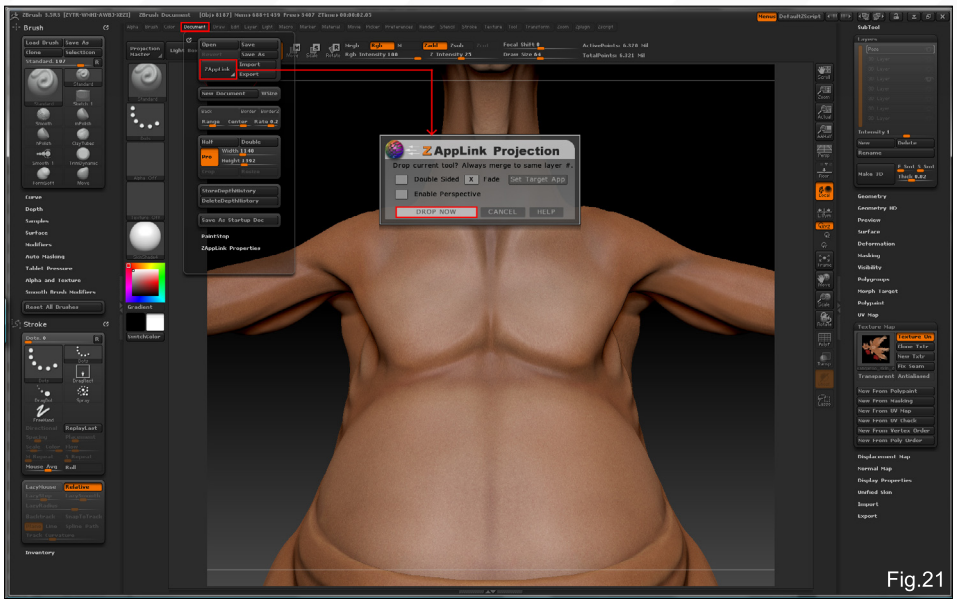
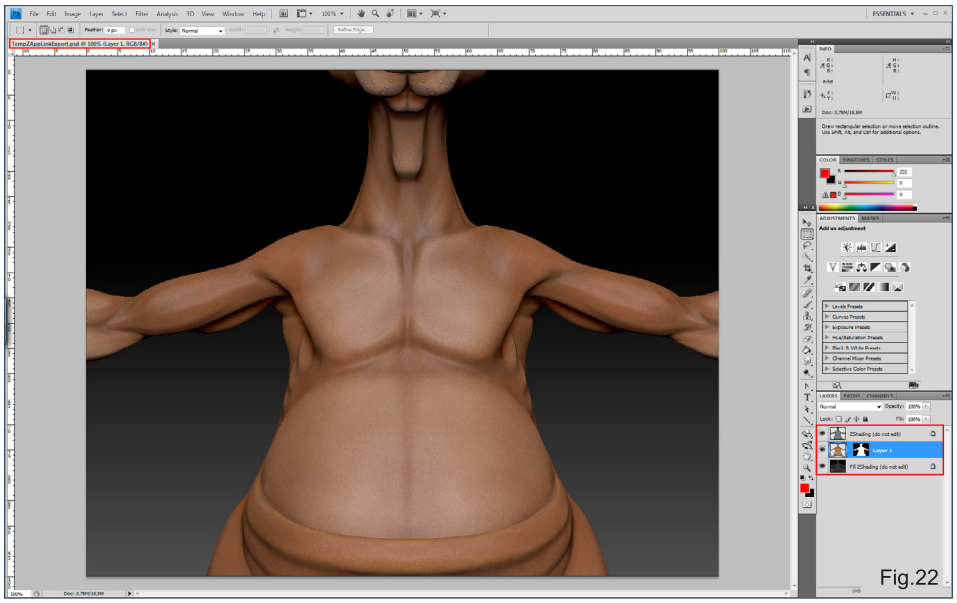


Fig.21

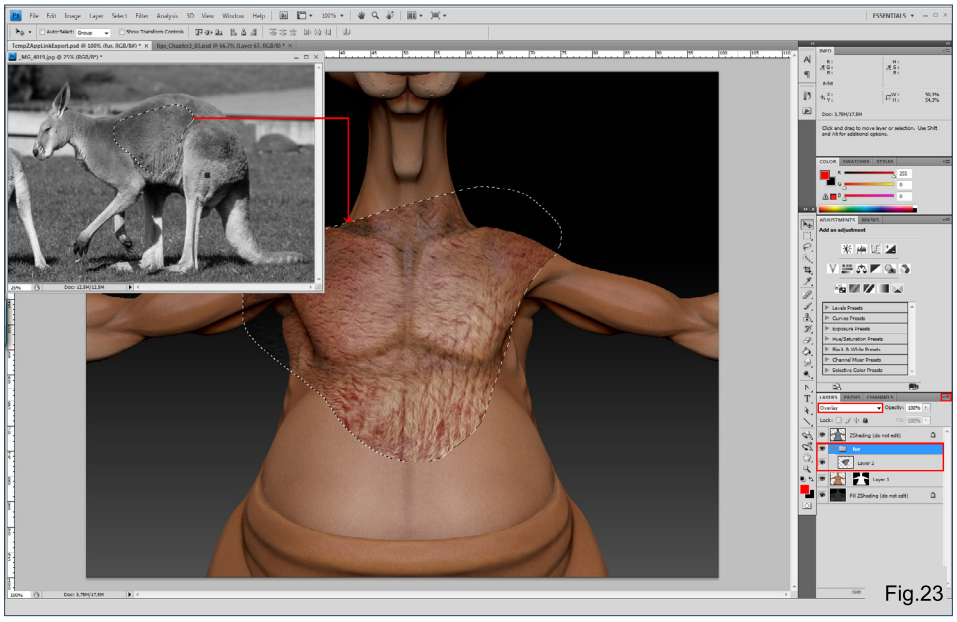
Fur 4 (**Fig.22**)
Photoshop will show up with a new PSD file open. This is a temporary file generated by ZBrush. We will paint our texture using Photoshop's tools and save it at the end. When we go back to ZBrush, the new parts of the texture we have painted will be projected to the ZBrush texture.


Fig.22

For this to happen without any problems we have to respect the layers' structure and naming of the temporary file.

- Do not edit or rename the ZShading (do not edit) and the Fill ZShading (do not edit) layers.
- Work on the Layer 1 layer, but DO NOT change the layer mask.
- If you create new layers, in the end you have to collapse them together with Layer 1, and make sure that this layer is named "Layer 1" (notice that there is a space between the word Layer and the 1) and with the same layer mask.

Fur 5 (**Fig.23**)
NOTE: If in this step you open ZBrush accidentally, just press the Return to external editor button.


Fig.23

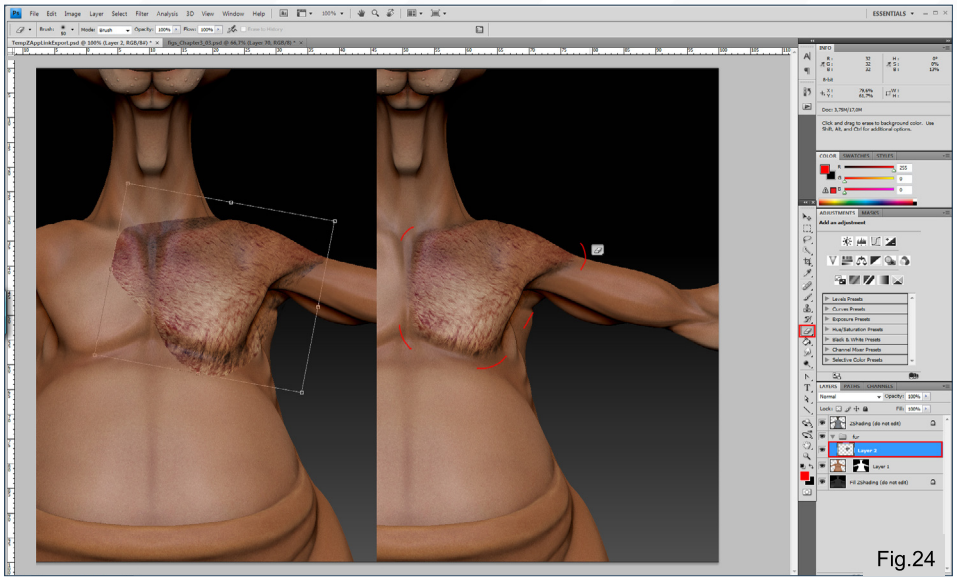
Let's go to 3DTotal's Free Textures site to download some kangaroo photos to create our fur.

- Go to http://www.freetextures.3dtotal.com/
- Inside Animals > Kangaroo download the "Kangaroo-598.jpg" and "Kangaroo-600.jpg" images at its highest resolution.
- Open these images in Photoshop.
- Desaturate the images (press Shift + Ctrl +U).
- Select a patch of fur from the kangaroo from the photo with the Lasso tool.
- Press Ctrl + C to copy it.
- Change to the ZBrush temporary image.
- Make sure that "Layer 1" is selected.
- Press Ctrl + V to paste it in a new layer directly above "Layer 1"
- With the new layer selected, click on the icon on the upper right corner of the Layers window and choose New Group from Layers...
- You will be prompted for a group name, so name it "fur".
- Select the "fur" group and change its blending mode to Overlay.

This will allow you to place all the fur patches inside this group and see how they work together. Using the Overlay mode we will have a better feedback of how the final result will look.

Fur 6 (**Fig.24**)

- Select the layer with the patch of fur and press Ctrl + T to freely transform it.
- Rotate, scale and position the patch in order for the fur to flow in a believable way along the surface.
- Double click to accept the transform.
- Press the E key to choose the eraser.
- Select a round and smooth brush (about 40 pixels wide) and erase the limits of your patch so that you have a soft transition around it.


Fig.24

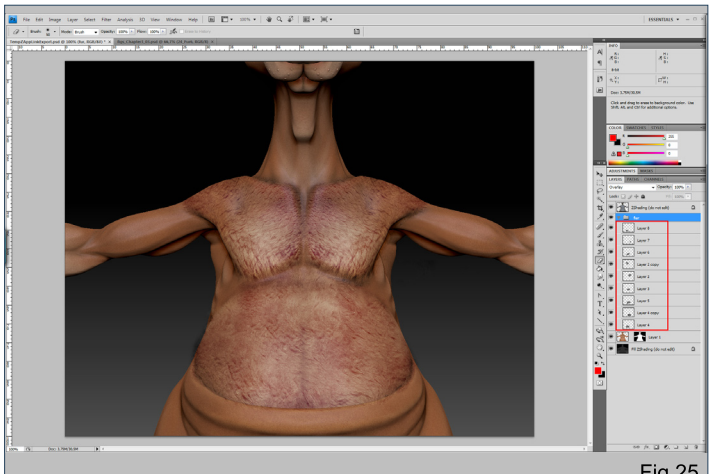
Fur 7 (**Fig.25**)

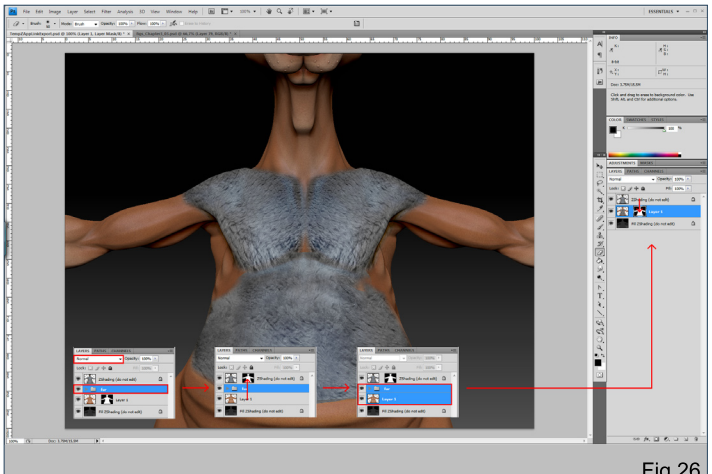
- Select a new patch of fur or keep pasting the same one inside the "fur" group.
- Place the new patches below the first layer or place it on top and erase the borders to make a soft transition to the other patches.
- Repeat the process until you have covered all the chest and belly area with fur.

Fur 8 (**Fig.26**)

We will turn the fur group back to the Normal blending mode, as we want to export it as a grayscale map. This is because in the end we will use this grayscale image to create various maps and also overlay it on top of the diffuse texture.

- Change the "fur" group blending mode to Normal.
- Drag the mask icon from "Layer 1" to the ZShading (do not edit) layer (this is a temporary action).
- Select the "fur" group and the "Layer 1" simultaneously.
- Right click and choose Merge Layers.
- Rename the merged layer as "Layer 1".
- Drag the mask layer from the ZShading (do not edit) layer to "Layer 1".
- Save (Ctrl + S).


Fig.25


Fig.26

Fur 9 (**Fig.27**)

- Open ZBrush.
- Choose Re-enter ZBrush.
- Choose Pickup Now.
- Wait for ZBrush to process the projection.
- Our painting is now applied to the texture (but not saved yet).
- In the Tool menu, in the Texture Map pull down menu, click on Clone Txtr.
- From the Texture menu click Export and save the texture as "kangaroo_skin_export.psd"

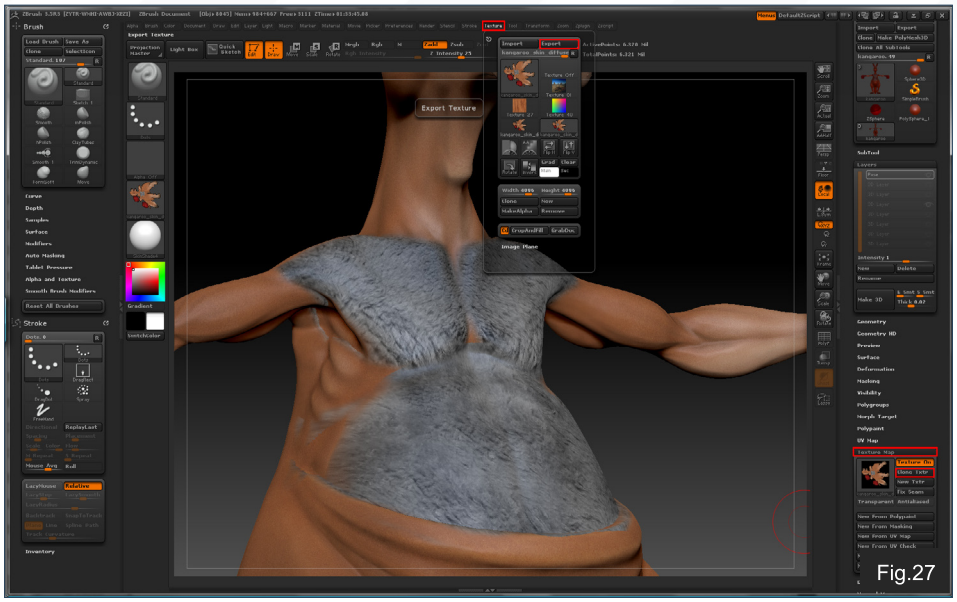
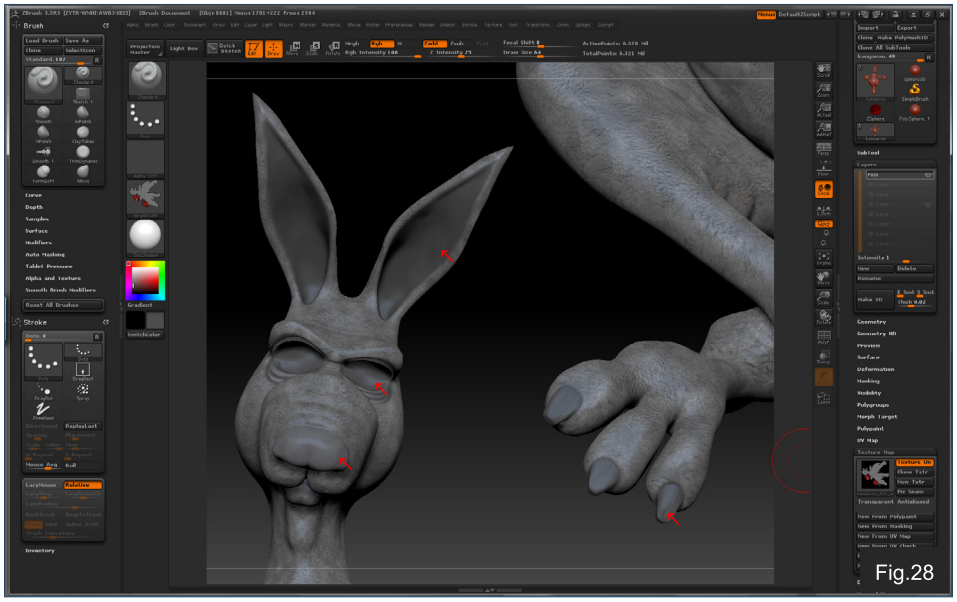


Fig.27

Fur 10 (**Fig.28**)

Now that you know the process, all you have to do is the following:

- Choose a new point of view where the fur still needs to be painted.
- Initiate ZAppLink as before and a new temporary image will be sent to Photoshop. If you are asked if the previous image can be replaced, say yes.
- Keep adding fur repeating the process I described.
- At the end save the temporary image and the new texture will be added in ZBrush without destroying the previous one.

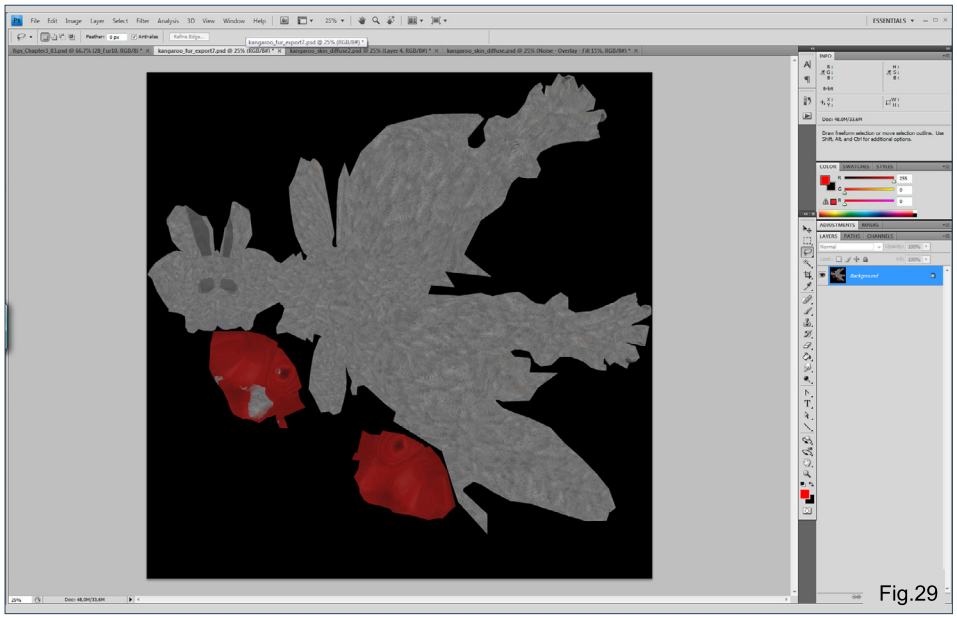

Fig.28

Do this process until you have covered the whole model. Be patient as this is a time-consuming task, but it will guarantee that you have well proportioned and correctly flowing fur on the full body. Remember that you can turn on the "pose" layer in ZBrush at any time and send that point of view to Photoshop to paint.

While painting the fur in Photoshop, fill the areas without fur with a uniform mid gray. This is the case with the interior of the ears, the interior of the eyes, the nose and the nails.

Fur 11 (**Fig.29**)

When you have finalized painting the fur, repeat the procedure described in the previous point to save it.


Fig.29

- Inside the Tool menu, in the Texture Map pull

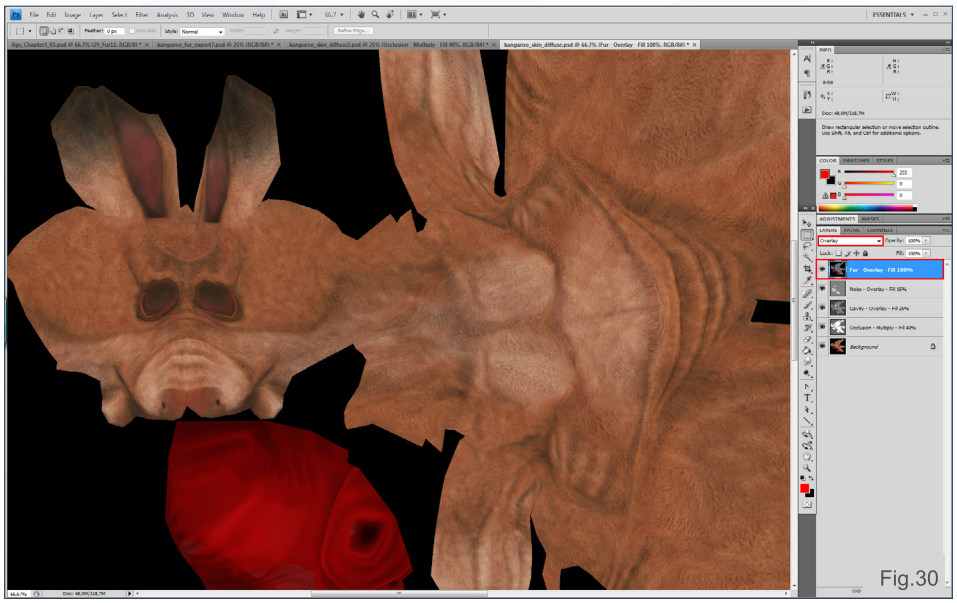
down menu, click on Clone Txtr.

- From the Texture menu click Export and save the texture as “kangaroo_skin_export.psd”
- In Photoshop open the “kangaroo_skin_export.psd” image.
- Press Ctrl + A to select all.
- Press Ctrl + V to copy the image.

Fur 12 (**Fig.30**)

We will overlay the fur texture we have painted on top of the existing diffuse texture.

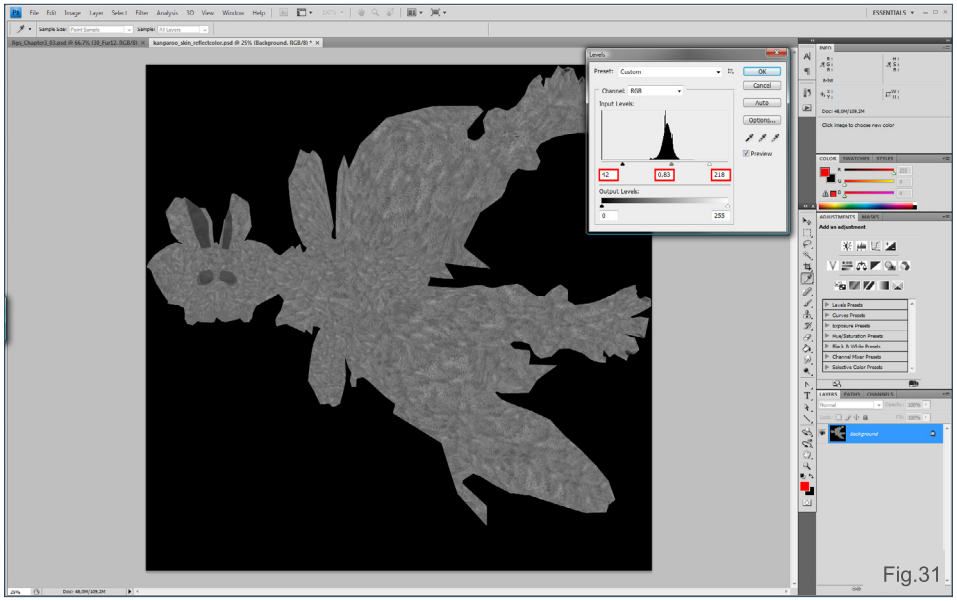
- Open the “kangaroo_skin_diffuse.psd”
- Press Ctrl + V to paste the fur texture on top of the existing layers.
- Change the fur layer blending mode to Overlay.
- With the Eraser tool delete any parts of the fur texture on the gloves.
- Save the image as “kangaroo_skin_diffuse2.jpg”.


Fig.30

Fur 13 (**Fig.31**)

Let’s create a reflection map, so that the fur has areas with different reflection levels.

- Open the “kangaroo_skin_export.psd”
- Adjust the image levels by pressing Ctrl + L.
- Set the minimum Input value to 42.
- Set the middle Input value to 0.83.
- Set the maximum Input value to 218.


Fig.31

Fur 14 (**Fig.32**)

The value (brightness) of the pixels will determine the reflection amount. In order to be able to read the pixels brightness value:

- Open an Info window (press F8).
- Click the small icon on the right corner of the Info window to access the Info Panel Option”.
- Change the Second Color Readout mode to HSB Color.
- Press OK.

Now when your cursor passes over the image you can read the pixel’s HSB values on the Info window. The B value is the pixel’s Brightness.

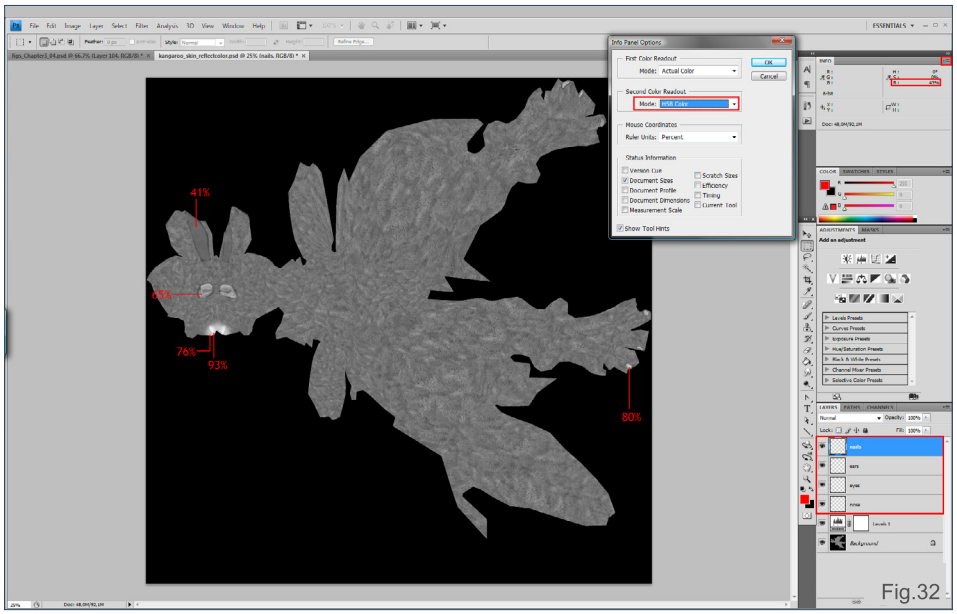
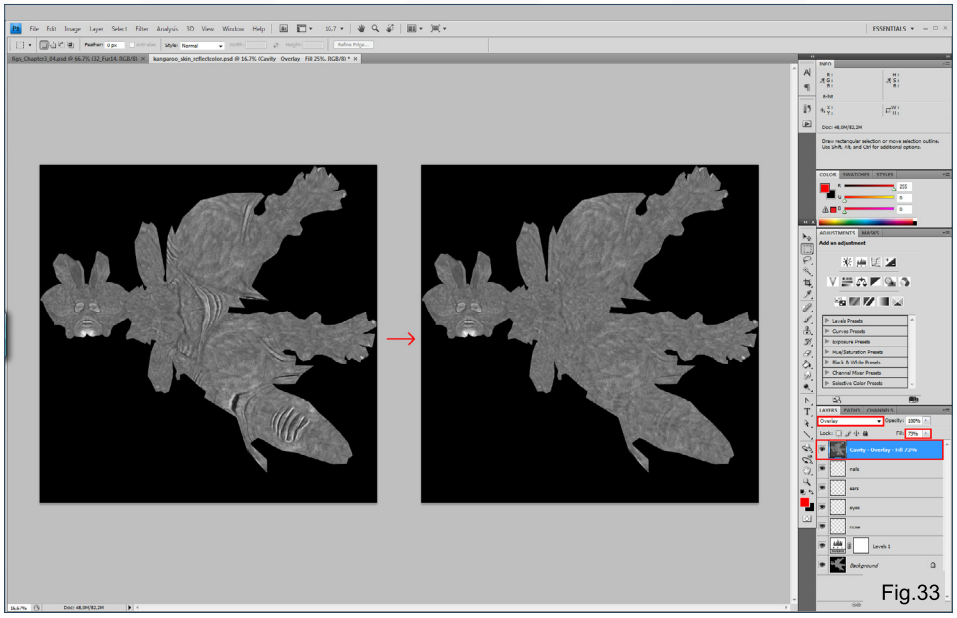


Fig.32

A value of 100% in interpreted in mental ray as 1, a value of 50% as 0.5 and a value of 0% as 0, and so on.

- Create a new individual layer for the nose, eyes, ears and nails.
- Paint each of these areas with pure white in their own layers.
- Change each layer's opacity, while reading the Brightness value of the pixels (in the Info panel) to ensure that the pixels in each area have a certain brightness percentage. You can use the eraser tool to fade the opacity in certain areas to create reflection variance.

Please check the image to verify the brightness percentages I have used and try to follow them. Notice how I have used different percentages of brightness in the top and front of the nose.


Fig.33

Fur 15 (**Fig.33**)

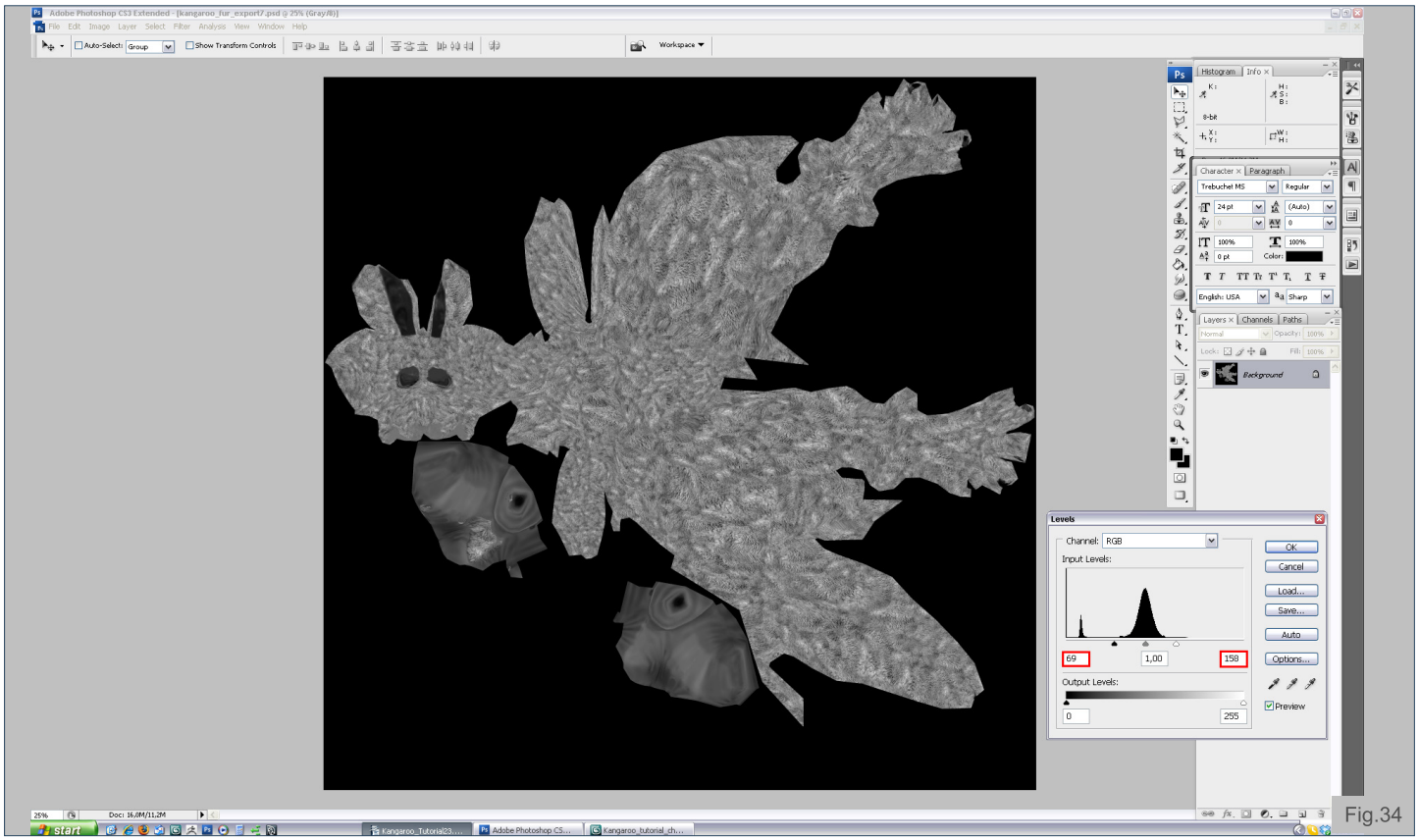
- Open the "kangaroo_skin_cavity.psd" image. Select all and Copy.
- Paste it on a layer on top of the reflection map we are creating.
- Set the layer mode to Overlay.
- Set the layer Fill to 73%.
- Erase or attenuate the stronger markings on the pouch and tail fold areas using the erase tool (as in the image).

Save the image as "kangaroo_skin_reflectcolor.psd".

Fur 16 (**Fig.34**)

We will now create the bump map.

- Open the "kangaroo_skin_export.psd" image.
- Press Ctrl +L to open the Levels window.
- Set the low input level to 69.
- Set the high input level to 158.
- In the Image menu, inside Mode, choose Grayscale.

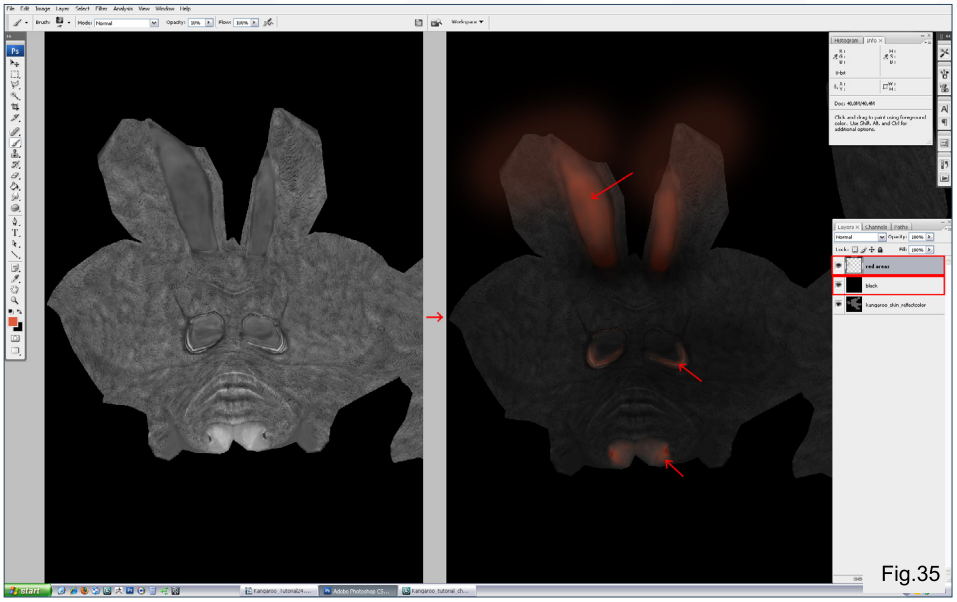

Fig.34

We have converted the image to gray scale, so it will only have one channel, therefore it will take less memory.

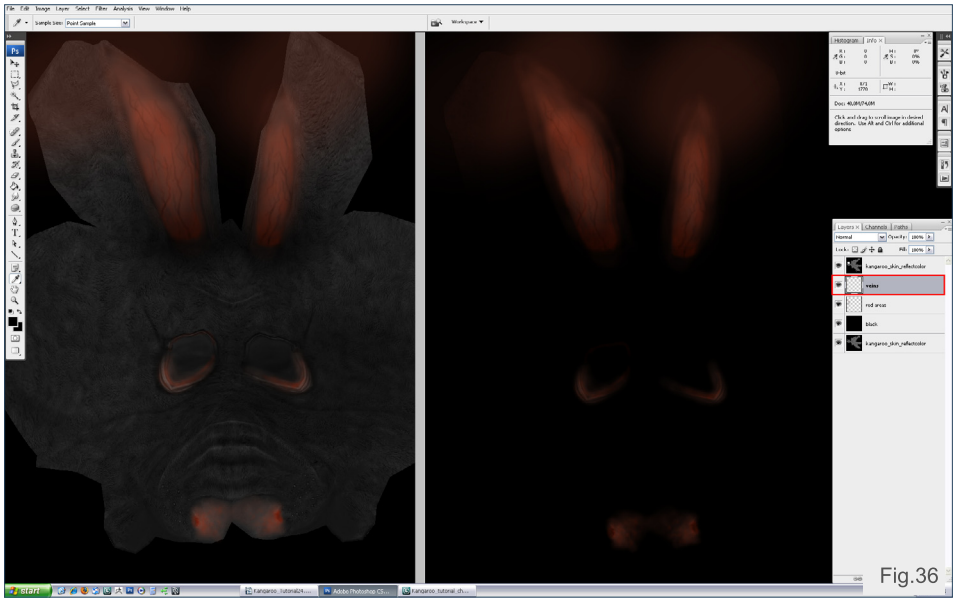
- Save the image as "kangaroo_skin_bump.psd".

Fur 17 (**Fig.35**)

We have lit the kangaroo from the back, so some subsurface scattering in the ears would look good. Instead of doing real subsurface scattering, we will fake it with a self illumination texture.

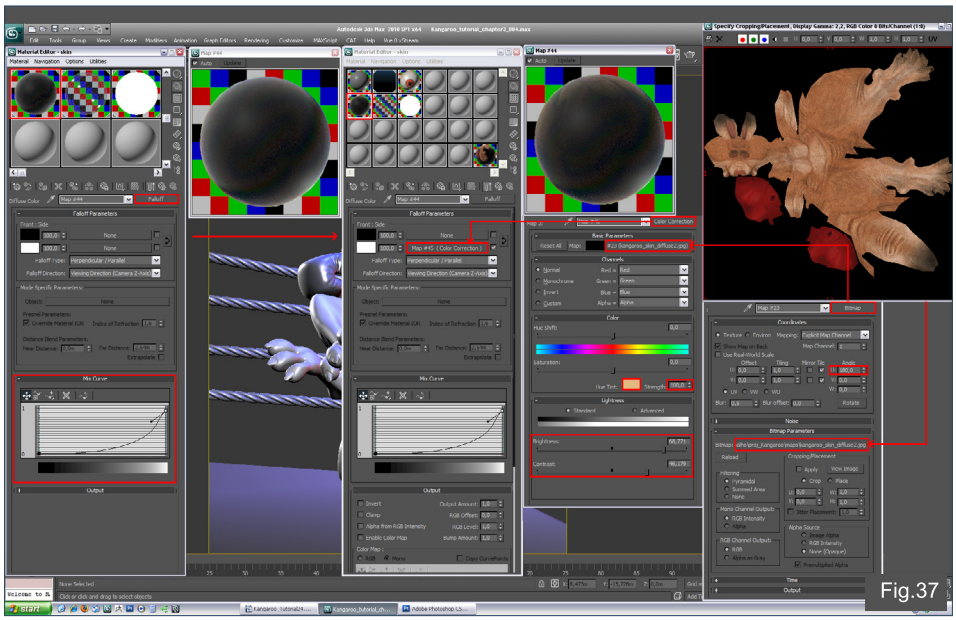

Fig.35

- Open the "kangaroo_skin_reflectcolor.psd" image. We will use it as a reference to paint the self illuminated areas.
- Create a new layer, name it "black" and fill it with pure black.
- Set the opacity of this layer to 65%.
- Create a new layer. Name it "red areas".
- Choose a soft rounded brush and set the color to a reddish orange (R:222, G:92, B:61).
- With a low opacity, paint the interior of the ears, inside the eye lids and the nose, especially around the nostrils. Try to paint it in an uneven way, Check the image for reference.


Fig.36

Fur 18 (**Fig.36**)

- Create a new layer, name it "veins".
- With a small soft rounded brush, with low opacity and using the black color, paint some veins inside the ears.
- Change the opacity of the "black" layer to 100%.


Fig.37

I have copied the "kangaroo_skin_reflectcolor" layer to the top, set the blending mode to Multiply and then lowered its Opacity to 65%. I have also erased the part of the image covering the ears. This step allowed me to preserve some of the detail on the painted areas, but it might not be necessary in your case.

Fur 19 (**Fig.37**)

We have created all the textures necessary for

the fur material. You might have noticed that we have saved all the textures in PSD format, preserving all the layers. If you wish, or have memory limitations, convert all the maps we have created to JPG. It is a good idea to keep the PSD files as we can always go back to them to fine tune the texture.

- Open 3ds Max.
- Open the material editor by pressing M.
-Choose the skin material.
- In the General Maps area click on the kangaroo_skin_diffuse slot.

Let's replace it with a falloff map:

- Click the Bitmap button on the top right and choose Falloff from the list. Accept to discard the map.
- Adjust the Mix curve as in the image, so that we have a color variance at the edges, which is typical of short fur surfaces.
- In the Falloff Parameters, click on the slot in front of the second color and choose a Color Correction map.
- Click on the map slot, choose a Bitmap type and choose the "kangaroo_skin_diffuse2.jpg" file.
- In the image setting change the Angle of U to 180, to flip the image vertically as we did before.
- In the Color Correction, change the Hue Tint color to a beige (R:0.77, G:0.48, B:0.22) and set the Strength value to 100.
- Change the Brightness slider value to 67.77 and the Contrast to 46.17.

We have created a brighter and beige tinted version of the skin diffuse map to show up in the edges of the model.

Fur 20 (**Fig.38**)

- In the Falloff, load the "kangaroo_skin_ diffuse2.jpg" to the first color slot.
- Don't forget to set the U angle value to 180 to flip the image vertically.
- Render to see the result.

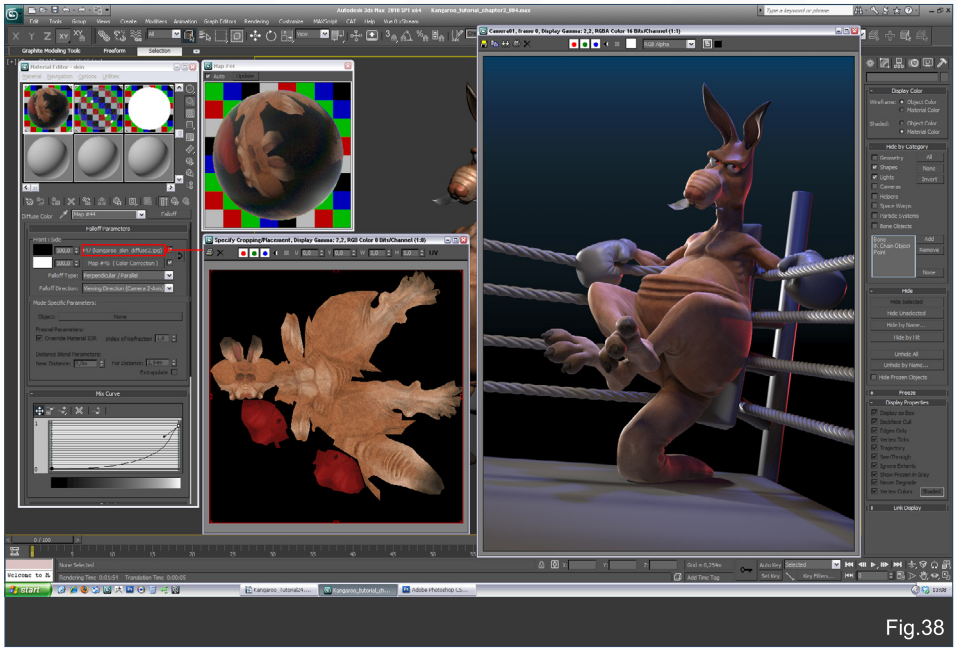


Fig.38

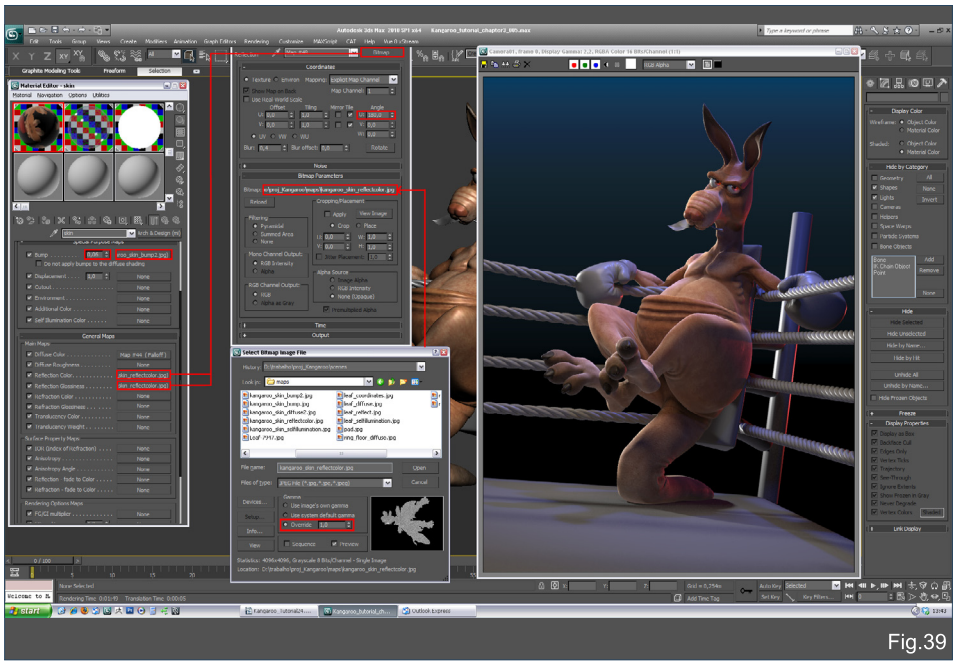


Fig.39

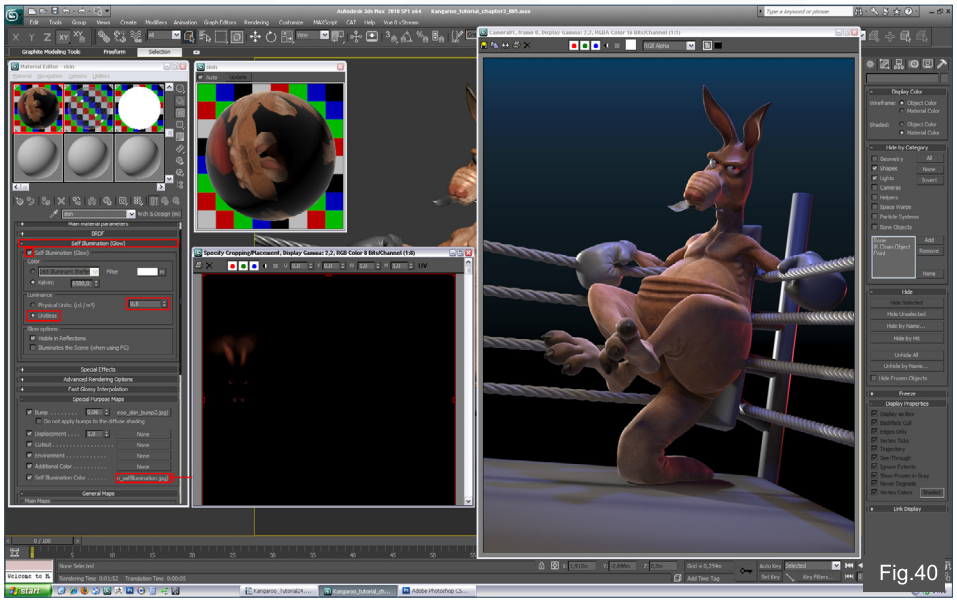
Fur 21 (**Fig.39**)

- In the skin material, click on the slot for the Reflection Glossiness map
- Select Bitmap type and when you are prompted to pick your file choose the "kangaroo_skin_reflectcolor.jpg".
- VERY IMPORTANT: When prompted for the file in the Gamma settings chose the Override option and set the value to 1.0. This way the gamma correction will not affect the color of the map. We have been setting the brightness values in the textures so that these values are interpreted by mental ray as glossiness values. If the texture is affected by gamma all the values become incorrect. Remember to do this for all maps with the exception of diffuse and self illumination maps.
- Don't forget to set the U angle value to 180 to flip the image vertically.
- Copy the "kangaroo_skin_reflectcolor.jpg" to the Reflection Color slot too.
- In the Special Purpose Maps area load the "kangaroo_skin_bump.jpg" image into the Bump slot. Do not forget to set Override Gamma to 1.0 and to flip the image vertically by setting the U Angle to 180 in this texture too.

- Set the Bump value to 0.06.
- Render.

Fur 22 (**Fig.40**)

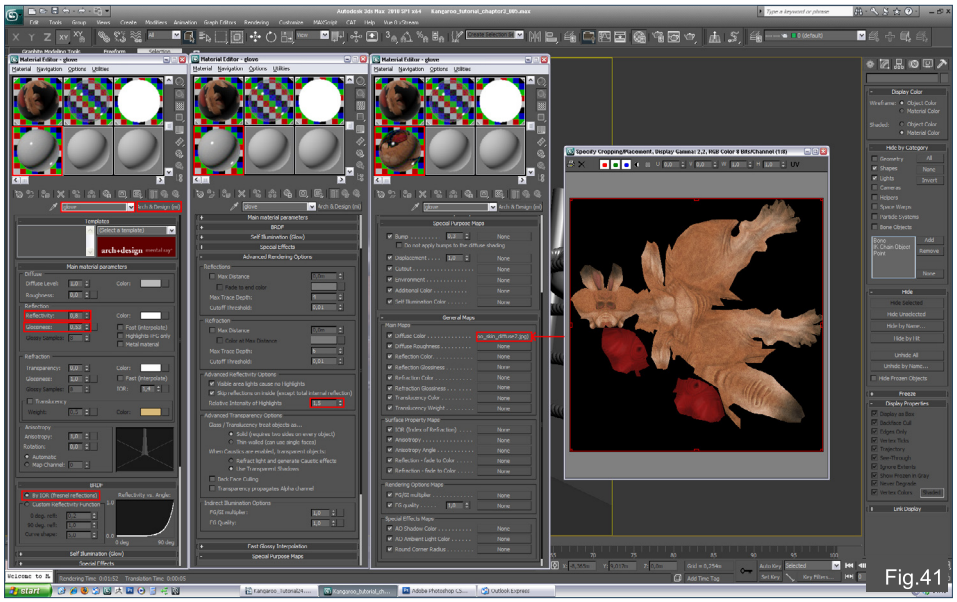
- In the Self Illumination (Glow) area of the skin material, turn on the Self Illumination (Glow) option.
- Change the Luminance type to Unitless and set its value to 0.5.
- In Special Purpose Maps load the "kangaroo_skin_selfillumination.jpg" image into the Self Illumination Color. Do not forget to flip the image vertically by setting the U Angle to 180. Do not change the gamma settings here.
- Render.


Fig.40

We have finalized the fur material.

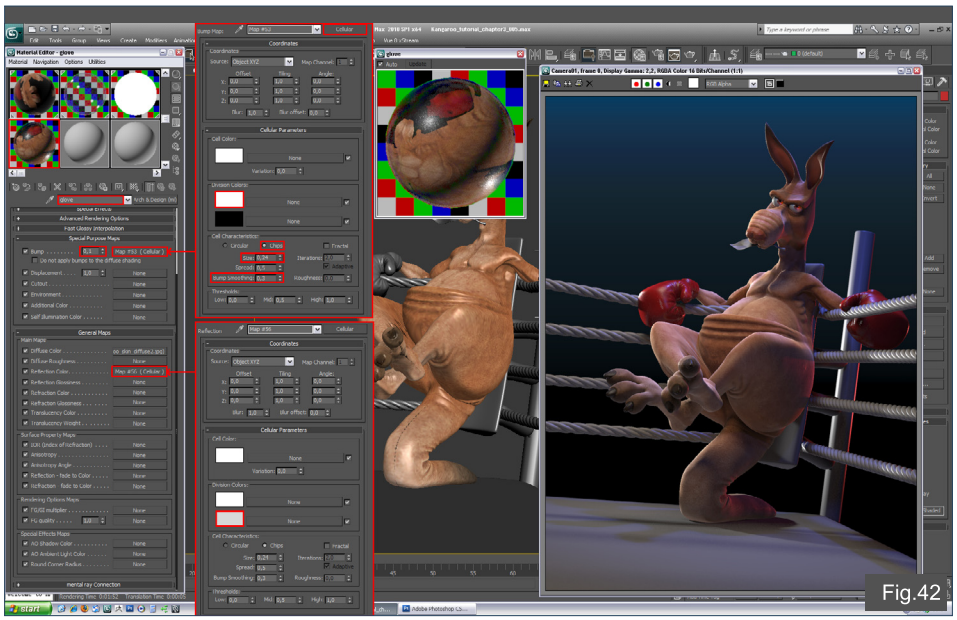
Gloves 1 (**Fig.41**)

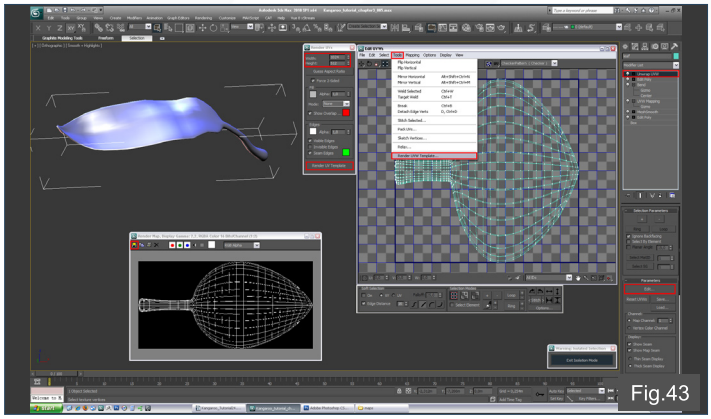
- Create a new Arch&Design (mi) material.
- Name it glove.
- Change the Reflectivity to 0.8.
- Change the Reflection Glossiness to 0.53.
- In the BDRF area choose the By IOR (fresnel reflections) option.
- In the Advanced Rendering Options increase the Relative Intensity of Highlights value to 1.5.
- In General Maps, load the "kangaroo_skin_diffuse2.jpg" into the Diffuse Color slot. Remember that we have painted the gloves and skin on the same texture and even though the gloves and body models are now separated they still share the UV space. Do not forget to flip the image vertically by setting the U Angle to 180.

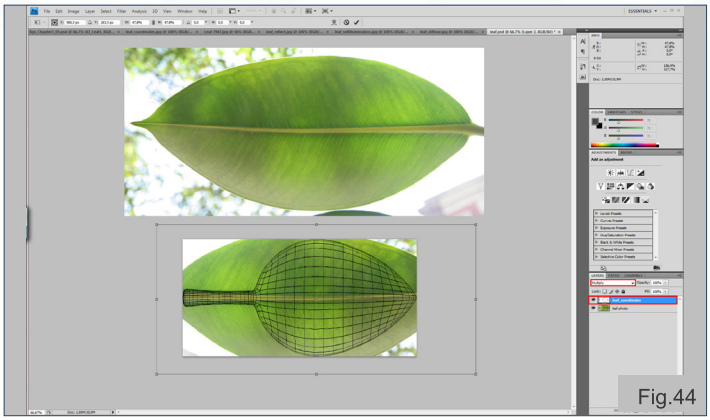

Fig.41

Gloves 2 (**Fig.42**)

- In Special Purpose Maps, set the Bump value to 0.1.
- Click the Bump map slot and choose a Cellular map type.
- In Cellular, change the first color in Division Colors to pure white.
- In Cell Characteristics set the type to Chips. Set the Size to 0.24 and Bump Smoothing to 0.3.
- Drag the Cellular map on the Bump slot to the Reflection Color slot as a copy.


Fig.42


Fig.43


Fig.44

- In the Reflection Color Cellular map, change the second color in the Division Colors to a light gray (R:177, G:177, B:177).
- Select the gloves object.
- Apply the glove material.
- Render.

Leaf 1 (**Fig.43**)

Let's create the texture and material for the leaf.

- Select the leaf object.
- Apply an Unwrap UVW modifier.
- Press Edit.
- In the Edit UVWs window, from the Tools menu choose Render UVW Template.
- In the Render UVs window set the Width to 1024 and the Height to 512
- Press the Render UV Template button.
- A new window with the render coordinates will show up. Click the disk icon on the upper left corner and save the image as "leaf_coordinates.jpg".

Leaf 2 (**Fig.44**)

- Go to www.freetextures.3dtotal.com and save the highest resolution version of the image "Leaf-7947.jpg" that you will find in the Nature/Leaf area.
- Open Photoshop.
- Open the "leaf_coordinates.jpg" image.
- Double click on the Background layer and rename it "leaf coordinates".
- Invert the image color (Ctrl + I).
- Open the "Leaf-7947.jpg" you have downloaded.
- Select all (Ctrl + A) and copy (Ctrl + C).
- Change to the leaf coordinates image and paste (Ctrl + V). Name this new layer "leaf photo".
- Drag the "leaf coordinates" layer to be on top of the "leaf photo" layer.
- Change the blending mode of the "leaf coordinates" layer to Multiply.
- Change to the "leaf photo" layer and flip it horizontally (Edit > Transform > Flip Horizontal)
- Press Ctrl + T to transform it and scale it like in the picture, aligning the center of the leaf the best you can.

Leaf 3 (**Fig.45**)

Let's darken the leaf and then distort it with the Liquify tool.

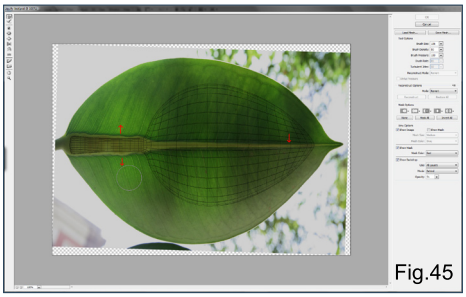
- Press Ctrl + U and adjust the Saturation to +18 and the lightness to -43.
- Go to Image > Adjustments > Brightness/Contrast and set the Contrast to +24.
- Go to the Filter menu and choose Liquify.
- Inside Liquify by dragging the mouse over the image, distort the center of the leaf to make it straight, and widen the stem of the leaf to cover the stem UV coordinates, as in the image.
- Press OK.
- Hide the "leaf coordinates" layer and save as "leaf_diffuse.jpg".

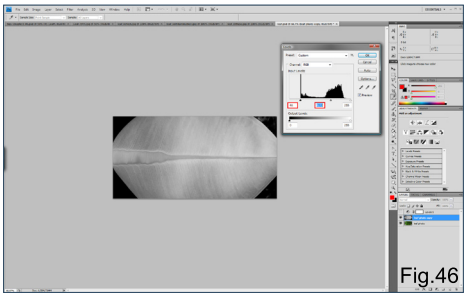
Leaf 4 (**Fig.46**)

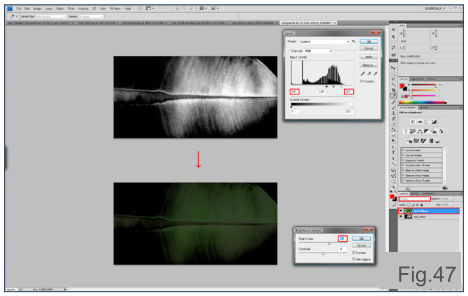
- On the same image, desaturate it (Shift + Ctrl + U).
- Invert it (Ctrl + I).
- Press Ctrl + L to adjust the levels.
- Change the low input value to 46 and the mid input value to 0.73.
- Save the image as "leaf_reflect.jpg".

Leaf 5 (**Fig.47**)

- Keep the image open.
- Press Ctrl + L to adjust levels
- Change the low input value to 147 and the high input value to 207.
- Open the "leaf_diffuse.jpg" image, select all and copy.
- Paste it as a new layer on top of the image we are creating and name it "leaf diffuse".


Fig.45


Fig.46


Fig.47

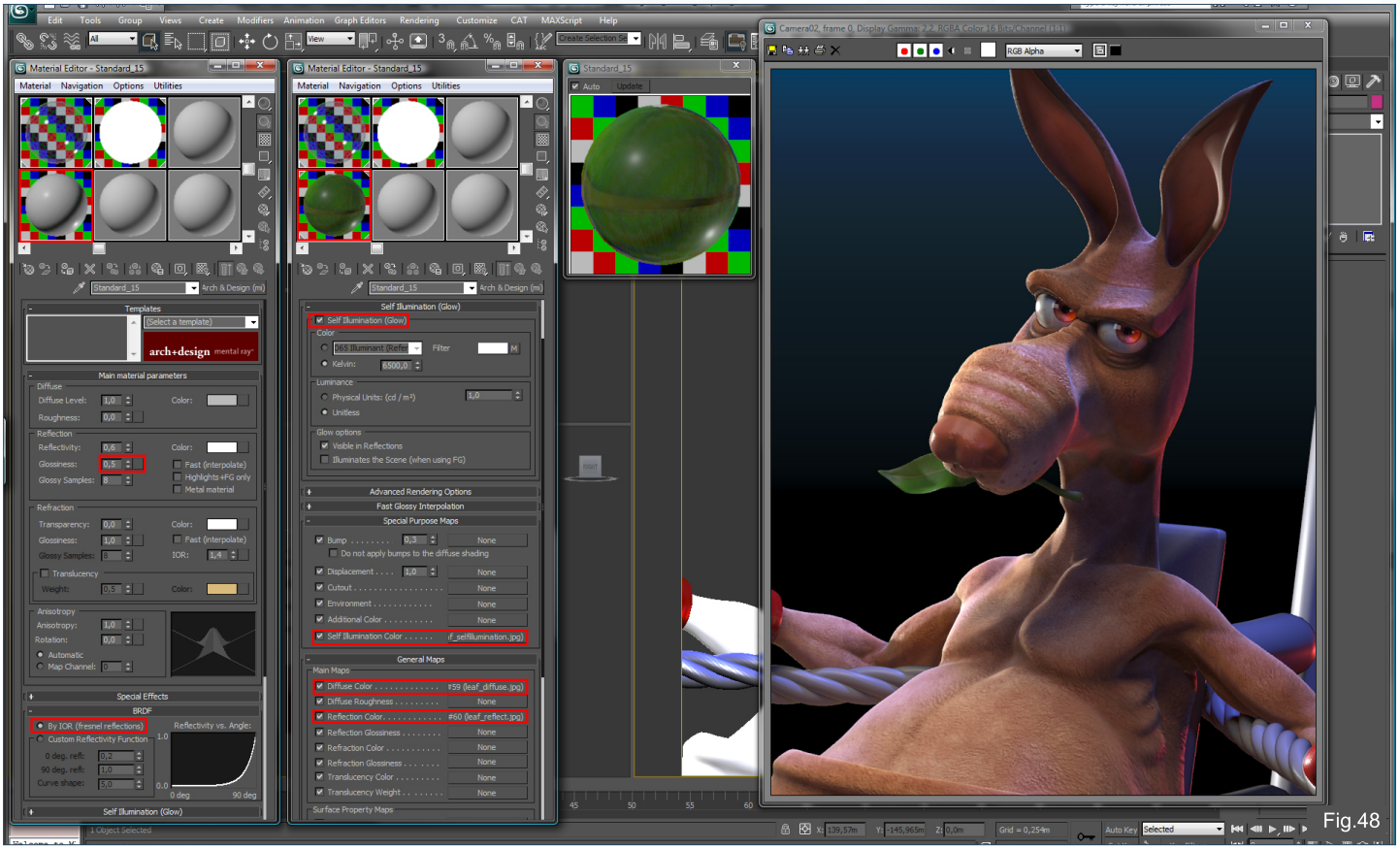


Fig.48

- Change the blending mode of the "leaf diffuse" layer to Multiply.
- Adjust the Brightness of the "leaf diffuse" layer by increasing it to 25 (Image > Adjustments > Brightness/Contrast).
-Save the image as "leaf_selfillumination.jpg".

Leaf 6 (**Fig.48**)

- Open 3ds Max.
- Open the Material Editor.
- Create a new Arch & Design (mi) material.
- Name it "leaf"
- Change the Reflection Glossiness to 0.5.
- In the BDRF area, choose the By IOR (fresnel reflections) option.
- In the Self Illumination (Glow) area of the skin material, turn on the Self Illumination (Glow) option.
- In Special Purpose Maps load the "leaf_ selfillumination.jpg" image into the "Self Illumination Color.
- In General Maps insert the "leaf_diffuse.jpg" in the Diffuse Color slot.
- In General Maps insert the "leaf_reflect.jpg" in the Reflection Color slot. Remember to override the Gamma value to 1.0.
- Select the leaf object and apply the "leaf" material.
- Render.

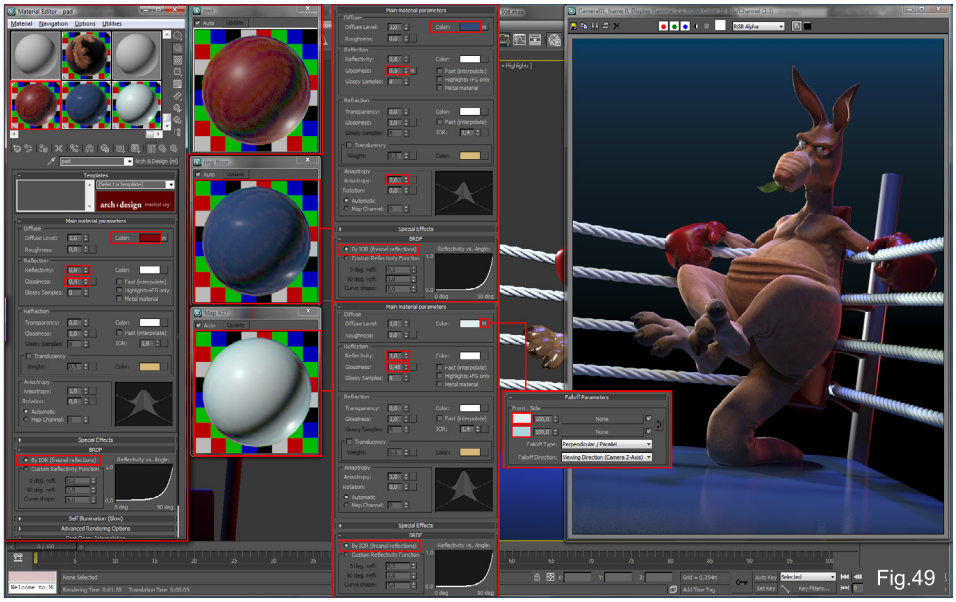


Fig.49

Ring (**Fig.49**)

Let's create a few simple colorful materials for the ring elements.

Pads:

- Create a new Arch & Design (mi) material.
- Name it "pad".
- Set the color to a dark red (R:0.22, G:0, B:0)
- Change the Reflectivity to 0.9.
- Change the Reflection Glossiness to 0.4.
- In the BDRF area, choose the "By IOR (fresnel reflections)" option.

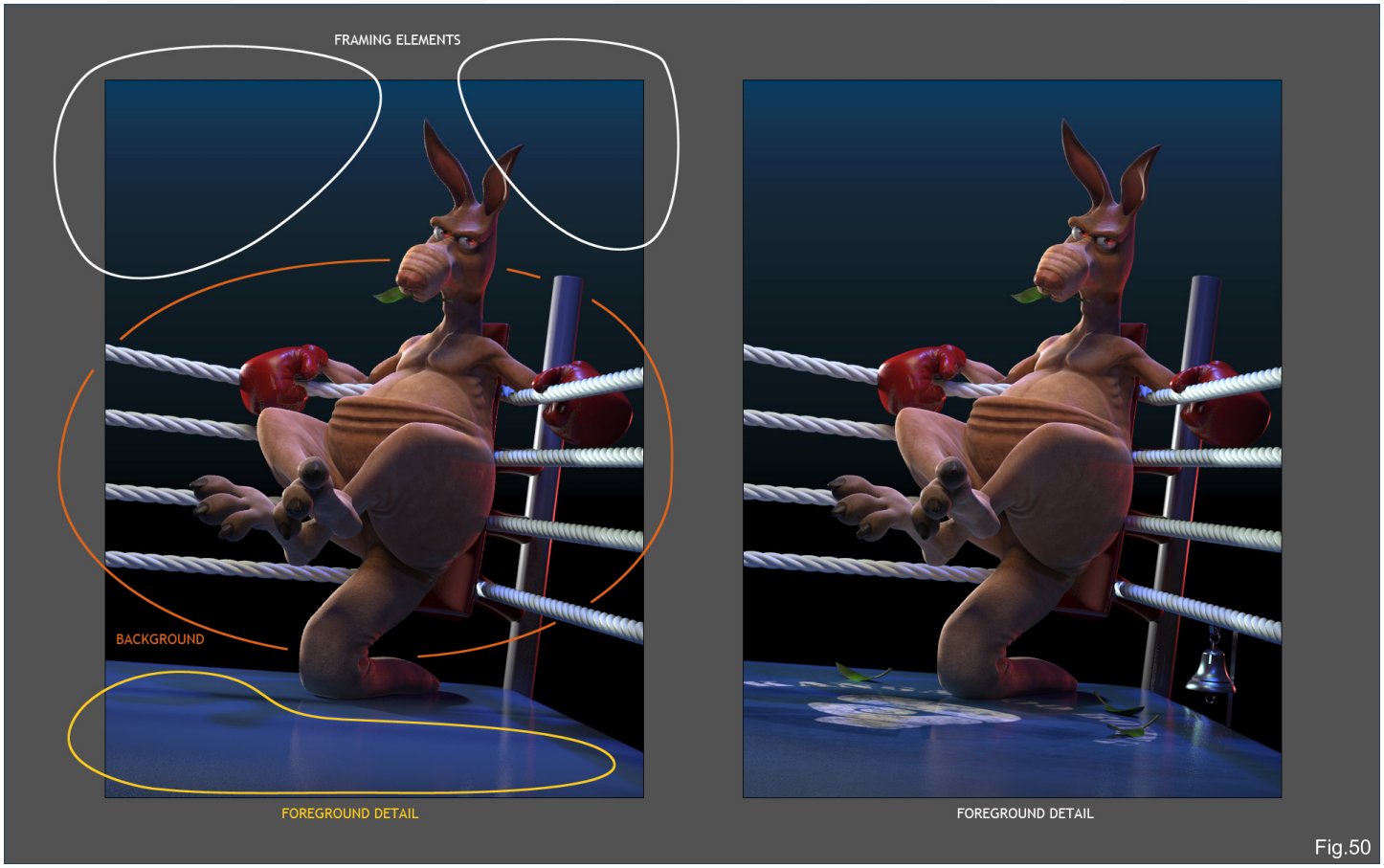


Fig.50

- Select the objects of the cushioned parts of the ring and apply.

Ring Floor:

- Create a new Arch & Design (mi) material.
- Name it "ring floor".
- Set the color to blue (R:0.02, G:0.06, B:0.19)
- Change the Reflection Glossiness to 0.5.
- Set the Anisotropy value to 2.0.
- In the BDRF area, choose the By IOR (fresnel reflections) option.
- Select the ring floor object and apply.

Ropes:

- Create a new Arch & Design (mi) material.
- Name it "ropes".
- In the Diffuse color slot choose a Falloff map type and set the first color to a blue-ish white (R:198, G:220, B:220) and the second color to a light blue (R:102, G:175, B:176).
- Change the Reflectivity to 1,0.
- Change the Reflection Glossiness to 0.45.
- In the BDRF area, choose the "By IOR (fresnel reflections)" option.
- Select the rope objects and apply.
- Render.



Fig.51

Finalizing 1 (**Fig.50**)

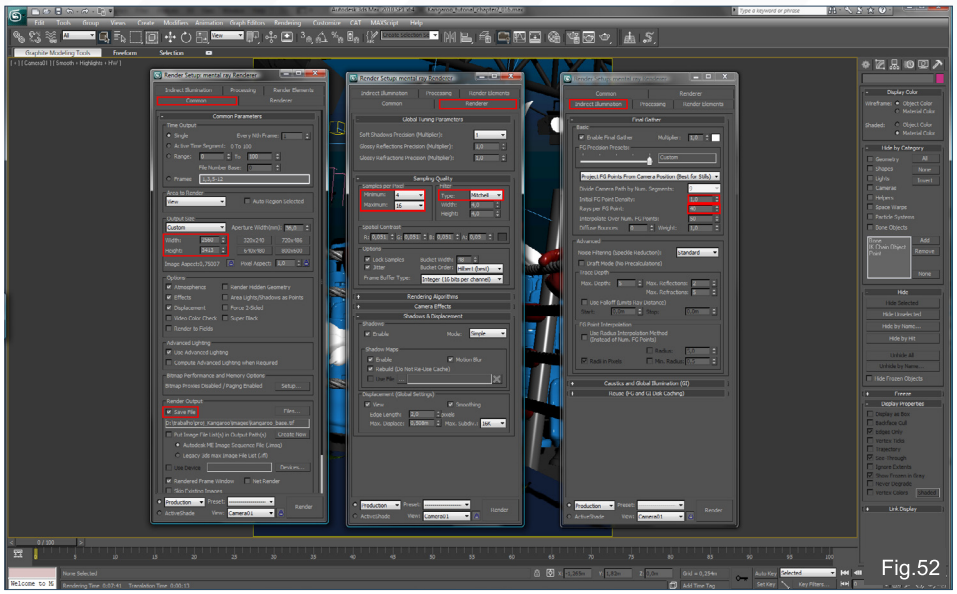
Our character is finished and I hope you have reached this point of this long journey! For presentation purposes I have decided to add some more elements to the scene and in the next steps I will tell you why I have taken some decisions.

The image is lacking some foreground detail, a background and a frame. To solve the foreground problem, I have added a big logo texture to the ring floor. I have also added some leafs to the ground and a bell on the right to balance the composition.

Finalizing 2 (**Fig.51**)

For the background, I have created a few chairs, as if they were the stands of a boxing ring. I have chosen the blue color for the chairs' material in order to produce an even colored background matching the background gradient and the ring floor. The blue color also makes the warm colors of the kangaroo pop out. I have also added an old character of mine in the back to convey a bit of story to the image and as a private joke for people who know my previous work.

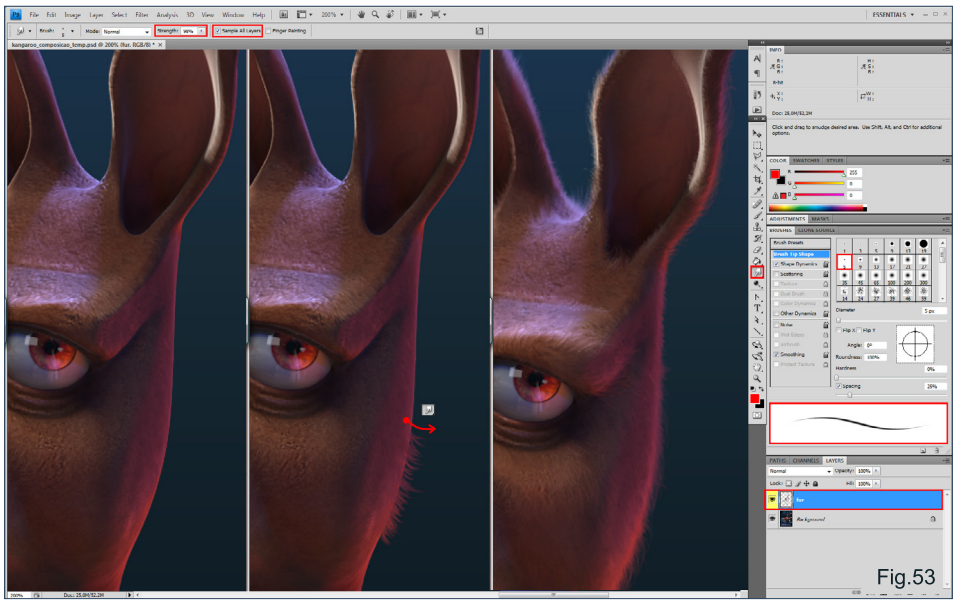
To frame the top of the image, I have decided to create a metallic beam with some hanging projectors and cables. These elements have been carefully placed in order to not overlap the kangaroo's silhouette. I have kept the projector structures dark, so that they don't compete with the rest of the image. The lit projectors on the right help us to keep the eyes on the top right area leading us to the mean stare of the kangaroo, reinforcing the character's personality.


Fig.52

Rendering (**Fig.52**)

With the scene ready, it is time to render.
I will describe the settings I have used:

- Press F10 to open the Render Setup window.
- In the Common Parameters area set the render output size to 2560x3413. In Render Output, turn on Save file and set a name and path for the image, I have chosen to save it in a TIF format, because it is a non-compressed format and will preserve the image quality.
- In the Renderer area, in Sampling Quality, set the minimum samples per pixel to 4 and the maximum to 16. Set the Filter Type to Mitchell. These setting will provide a nice and sharp anti alias.
- In the Indirect illumination area, in Final Gather, change the Initial FG Point Density to 1.0, this will calculate the final gather for each pixel on screen. Increase the Rays per FG Point to 40.
- Render. Expect this to take a few hours.


Fig.53

Last touches 1 (**Fig.53**)

There is a limit to what you can achieve just with textures when representing fur. The greatest problem is the silhouette. The fur might look convincing in the central areas of the body, but in the silhouette you can clearly see that the surface is smooth. So, for the presentation image I have decided to paint the fur on the silhouette. There is a pretty simple way to do this and I will teach it to you.

- Open your final image in Photoshop.
- Press F5 to open the Brushes window.
- Create a new layer and name it "fur".
- Select the Smudge tool from the tools palette (press R in Photoshop CS3).
- In the Smudge options, at the top of the page, set Strength to 98% and turn on Sample All Layers.
- From the default Photoshop brushes choose the Soft round 5 pixels brush.

You need to have a pressure sensitive pen for this technique. If you don't have one, in Shape Dynamics change the Control mode under Size Jitter to Fade, and establish the number of pixels distance for your brush stroke to fade.

With this setup when you use the Smudge tool. It will pick the color from the layers below, smudge them and apply the smudged pixels to the "fur" layer. As a result, every time you


Fig.54

draw a stroke it will use the color at the origin of the stroke. As we have a varied texture on the surface and the light falling on it, each hair you paint carries that information, so each hair will have a different color and look as if it is lit by the scene's light.

- Create little brush strokes starting at the kangaroo skin and fading the pressure to the outside to draw each individual hair at the silhouette.

- Be careful to paint the hair by starting to paint the ones further away, so that the new fur covers the fur on the back.

It is as simple as that. Now you just have to do it around the character's silhouette and in the places where there are light/shadow transitions.

Last touches 2 (**Fig.54**)

Please check the image to see how I have painted the fur around the folds, at the silhouette and light transitions.


Fig.55

Last touches 3 (**Fig.55**)

In order to provide a denser atmosphere, I have added some smoke at the top of the image by picking images of white smoke against a black background and placing them on a layer with a Screen blending mode on top of the image. To finalize, I have created the glow streaks on top of the projectors, by painting a light blue color with low opacity in a new layer with a Screen blending mode.

Final (**Fig.56**)

The image is finally ready! I hope you have enjoyed following this tutorial and I look forward to seeing your kangaroos!

Jose Alves da Silva

For more from this artist visit:

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Fig.56

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3DC next month

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Mudbox Female Character Creation:
Chapter 5 - Vampire
by Wayne Robson

How to Stylize and Model Toon Animals / People
Chapter 4 - Concept & Modeling
by Fabricio Duque

Environment Lighting: Indoor Scene
Chapter 4 - for 3ds Max + Vray
3ds Max + MR, Maya, Cinema4D

Introduction to Rigging
Chapter 6 - for 3ds Max & Maya

Interviews

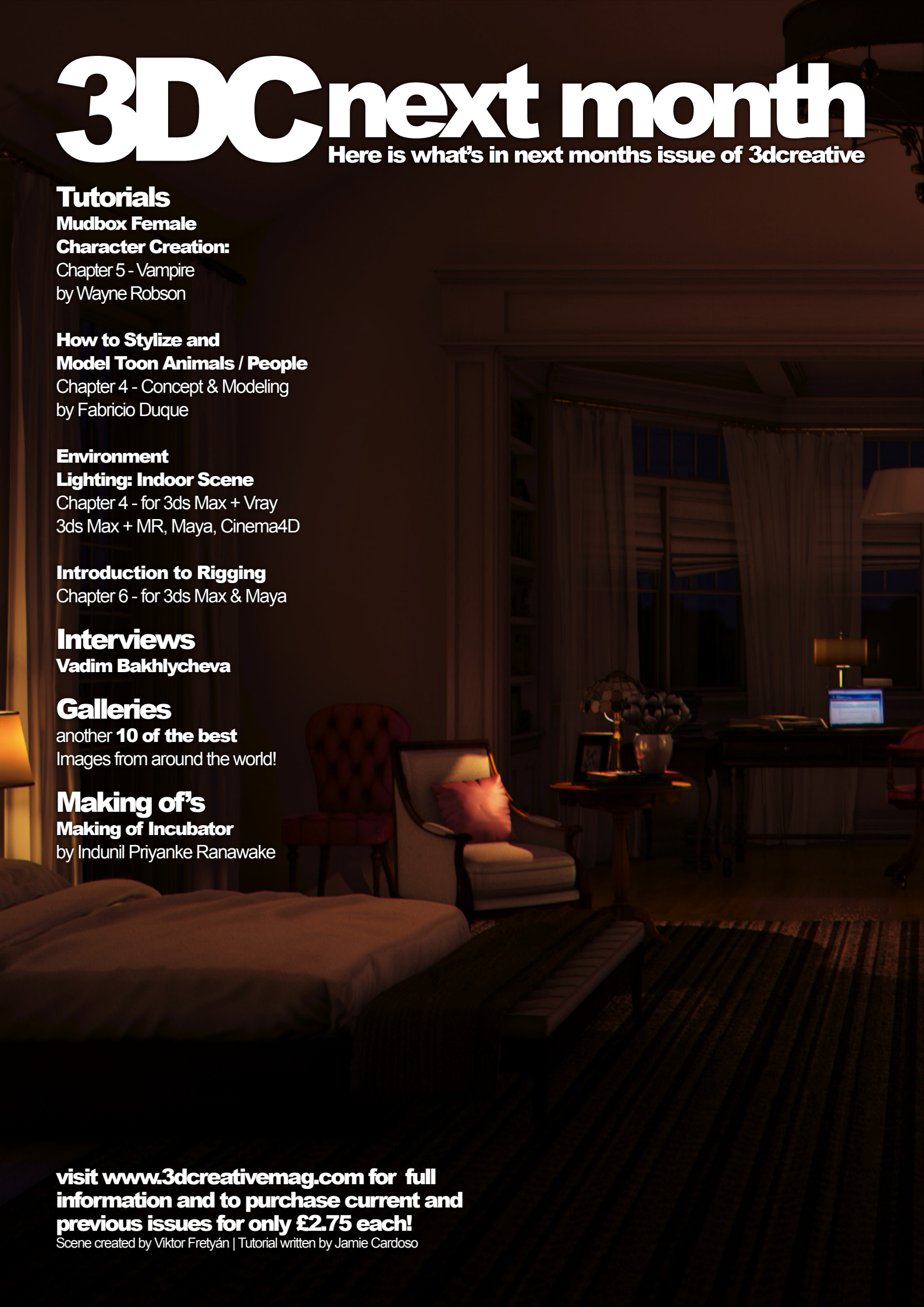
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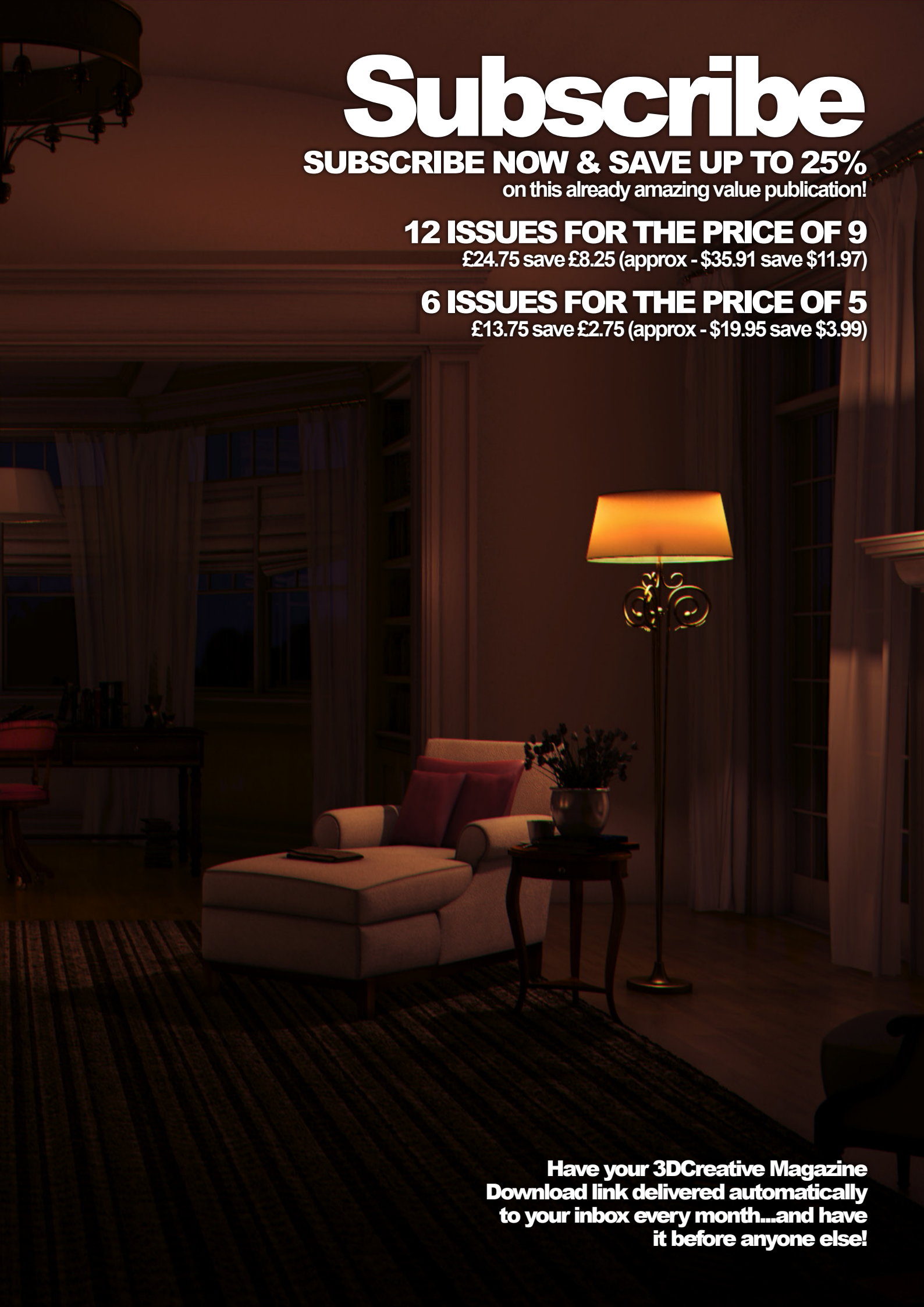
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MUDBOX

FEMALE CHARACTER CREATION

Welcome to Mudbox female character creation with Wayne Robson. This series will be providing a comprehensive guide to sculpting female characters using Mudbox. Wayne Robson will talk us through identifying the characteristics that define what is unique in each of our female characters, and will then give advice about sculpting these using many of the features that are available when using Mudbox.

Chapter 1 | May Issue 056
Gaunt / Old

Chapter 2 | June Issue 057
Obese

Chapter 3 | July Issue 058
Extreme Piercings & Tattoos

Chapter 4 | This Issue
Zombie

Chapter 5 | Next Issue
Vampire

Chapter 6 | October Issue 06
Werewolf

CHAPTER 4 - ZOMBIE

Software used: Mudbox

INTRODUCTION

"An artist must destroy as well as create'" – John Lennon

Last month we took (arguably) a pretty attractive young girl and covered here in piercings and tattoos. In this session we will take that model and add some death and destruction. She's going to be this month's cover girl on "Zombie Babe Weekly" (I'm joking of course, but you'll see the reason for the dark humor later on).

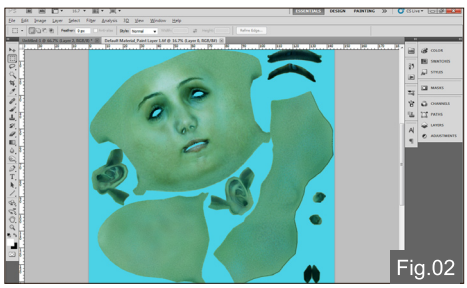

Fig.01

Using last month's model as our starting point gives us a chance to delve a bit deeper into the land of Mudbox than before, as well as into some image post work and a workflow that will help make life easier (**Fig.01**).

"IF YOU HAVE TO MODEL A TABLE, LOOK AT TABLES"

Most of the time when a zombie is done in either digital or traditional media, people are basically replicating a George Romero type zombie or something seen within the pages of a comic or book. I'm not a believer in that, I believe that as we try to replicate life as closely as we can often in 3D, why not treat death in exactly the same way? If you are going to make a zombie, and you want to do a believable job, or even close to one, then you will have to step over into a darker world than you usually inhabit.

I warn you this is a pretty hardcore approach to reference gathering that is not for everyone. To put it bluntly you are going to need pictures of lots of dead people in various stages of decay. Only then can you hope to do even a passable job of creating "the living dead'".


Fig.02

Most people don't find this pleasant; in fact after gathering the references for this article I found I needed to spend a bit of time deep in the country side about seven miles from other humans. Art isn't always pleasant or safe or nice pretty butterflies; sometimes it can help bring the world into a dark focus that is often overlooked when you look at a zombie in a film or in an image. Don't forget that we are replicating death in a living form... so all bets are off regarding what is "real" for a human head.

As a side effect of this article I now have a reference drive safely hidden in a cupboard that is like the seventh level of hell. But if anyone says to me that "dead people are blue not green" I can politely point out that dead people come in a number of strange shades and colours from blue, to black and shiny like tar, to purple, green, a mustard yellow... and let's not even get into the internal organs as some of you may be eating lunch.

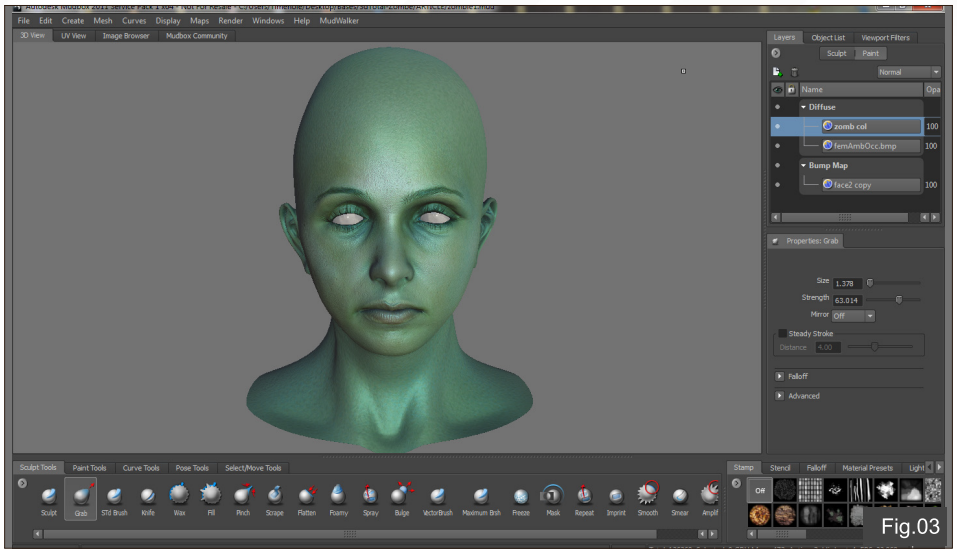
No doubt you're thinking "But Wayne, it's a pretty standard zombie, does it really make that much of a difference?" This is what I term the "tame legal to print in this magazine" version, not the full on horror show it could be. Unsurprisingly I'm not the first artist to use actual death as a reference for zombies or art involving dead people. If you had to do a photo real dinner table you'd look at a lot of dinner tables... this is no different. Only the chances are you won't be showing photos of your work to your granny (unless she's a little bit odd.) Let's not forget that Leonardo Da Vinci regularly dragged corpses into his house to take them apart and draw them and learn anatomy. (So I feel a little sorry for old Leo's neighbours, it must have been a nightmare on the day the trash got emptied!)

Now that some of you probably think I'm one step away for Charles Manson and Jeffery Dalmher let's get onto the actual work.

COLORS

My first job was to look at my reference files and decide what wonderful shade of death I wanted to replicate. I went for a green as it's a bit different from the blue/grey of rotting tar covered zombies, and plus if I ever want to turn her into "she hulk" I've got a head start. The green in this case comes from an image of a 25 year old woman found in water one week after death. Skin goes green in some cases such as this and also contains some mustard colors and light browns that just scream "Mudbox stamp set to scattering", or maybe that just me... yeah that's probably just me actually (**Fig.02**).

The skin I then turned green by importing our old nice pink skin into Photoshop and using Hue and Saturation with colorize set on and turned her green. I also had to desatuate it a little or she would have been florescent green instead. This is our starting base texture that we will add to, to create skin that replicates a green skinned dead woman (**Fig.03**).

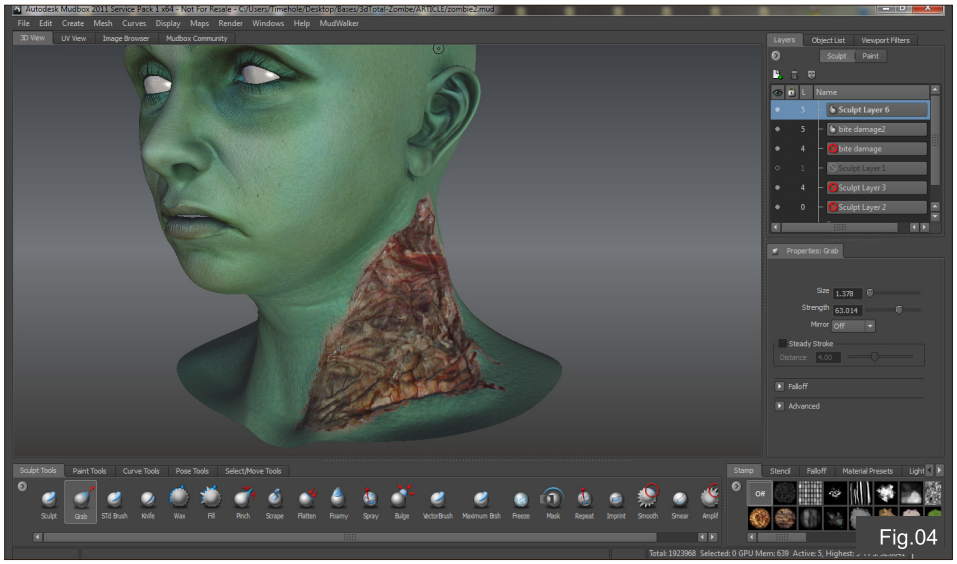

Fig.03

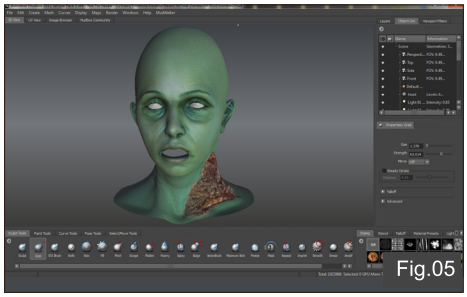
If you look at the videos the colors and scattering is explained, I'm going by "feel" on this and referring to my reference images occasionally off screen. I am not thinking, I am not trying to be one step ahead of what I am doing, this stage is pure instinct and you must trust your "inner artist" to get it right. I find that speeds things up a lot actually; over-thinking anything in life can cause all sorts of problems.

"NOW THAT'S A LOVE BITE!"

So far we have a woman with green skin that will look nice and dead once we import it into our rendering application (in my case 3ds Max), but she's not exactly going to be the cover girl of "PlayZombie". This is where we have to import a bit of film fantasy into our reality as many people (hopefully) aren't in the habit of knowing what a rotting dead person looks like in various stages of decomposition. So what makes a zombie? Well here's my list of my own personal favourite zombie identifiers:

- Although zombies are dead people they can move and seem to have lost all but most basic motor control. So they should not be able to run faster than Linford Christie or jump higher than the Hulk on steroids.
- They like to eat living people (and sometimes animals if times are hard)
- Your average zombie isn't exactly tops on personal hygiene so they won't be washing or cleaning themselves after they have dined on your spleen.
- They do not have very good motor control so are a bit floppy and gangly
- Death doesn't seem to make their temper any better; in fact it seems to send them from "normal everyday person straight into land of a thousand psychos" on the anger scale in six seconds.
- Zombies do not smile, drink beer or wallpaper your bedroom

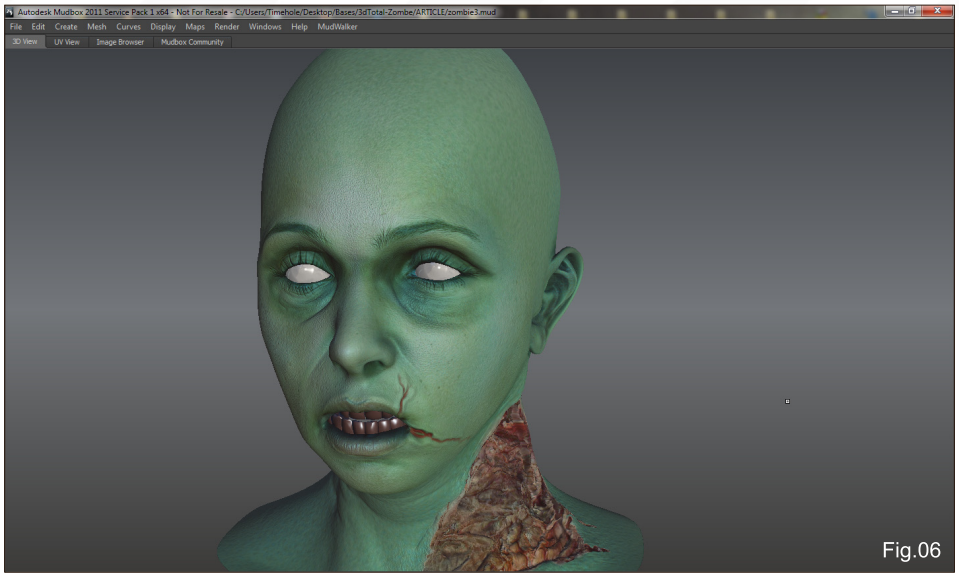

Fig.04

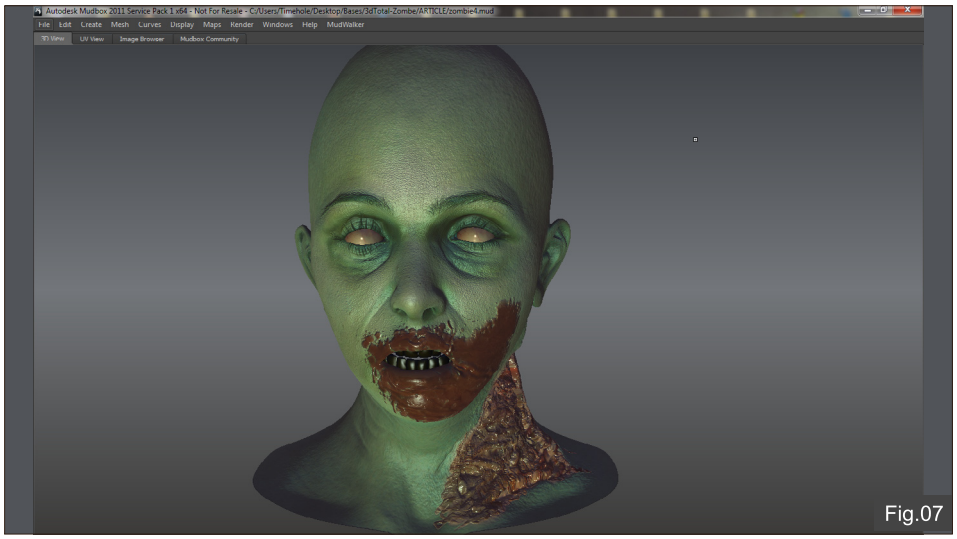

Fig.05

So out of this list, the first thing I noticed is that a zombie may or may not be visibly damaged near the neck or head (**Fig.04**). So I decided that a nice big juicy chunk of skin bitten out of the neck would do nicely. This also would help us later on with our posing, but more about that later.

To inflict some "bites of death" onto our poor girl. I dragged out a nice image of some meat. The only reason for not using a photo textures from a real damaged dead person is that it would be seen on the videos and that would probably break quite a few of 3DCreative's rules. So this is cop out number one to stay within the rules. I used the Photo Project brush on this to get the texture where I wanted it. Now be sure to check your source image is of a sufficient size to be usable without blurring out (**Fig.05**). We want some nice sharp looking detail.

I then erased around the edges of this to make some parts a bit sharper and less faded out. Then it is a simple matter of sculpting along with this meat (**Fig.06**). We don't need to go too fine with our detail as we can rely on the image itself later for out bump map and hence very high frequency detail.


Fig.06

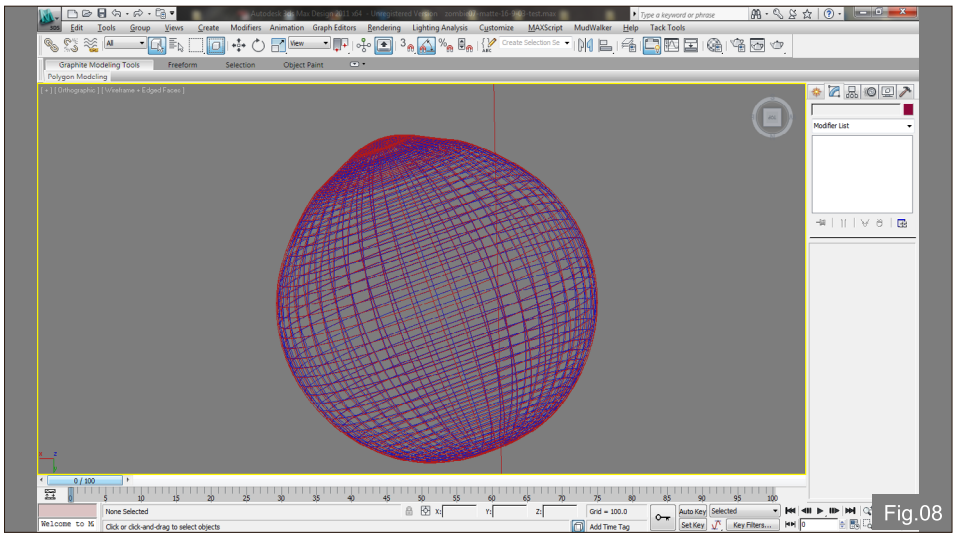

Fig.07

WINDOWS OF DEATH

Yes I'm referring to the eyes of course. In a living person the eyes are said to be the window to the soul and as we know, get these wrong and it's going to hurt your final render. However the eyes of the dead give us a wee bit of a problem as the eyes of a corpse such as this one would have lost its lens (becoming detached during decomposition) and the iris itself would collapse onto itself. The eye ball would also lose all shape and we would basically have a squashed squishy mess. It's also very disconcerting to see, so I made a decision to use cop out number two in this case (**Fig.07**).

My choices from a design point of view were to either keep our eyes from last month (not a good idea as they look far too alive), use what I term the Linda Blair eyeball (the famous exorcist contact lens look) or go with something a bit odder but based in absolute reality (**Fig.08**).

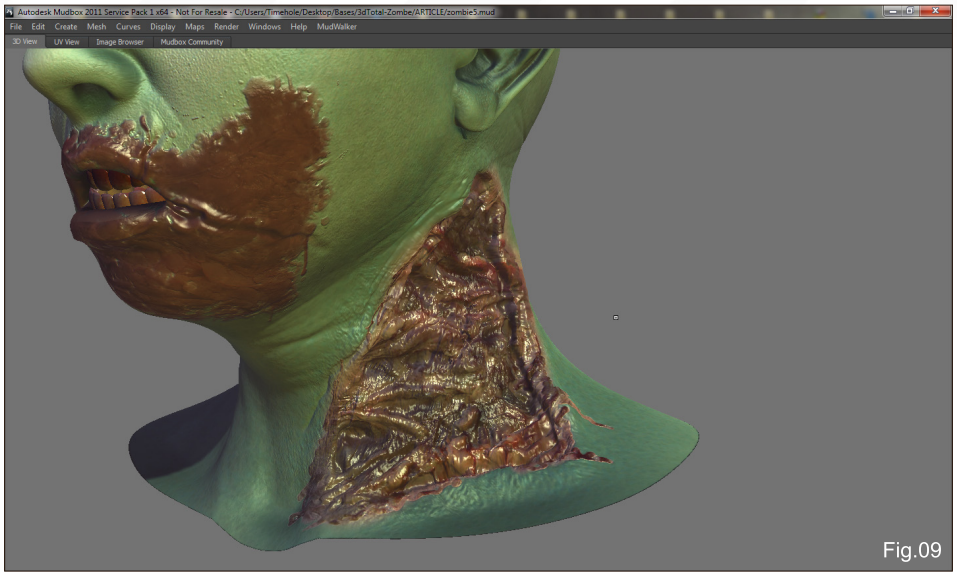
The texture used on the eyes in this case come from a 50 year old blind woman after death. She was born without pupils or iris and as such they make for wonderful zombie white eyes. This also provides us with a problem because as there is no lens on the eye we can't construct the eye in the way we would usually with a lens with a higher spec and gloss value. We have a single piece of geometry. (Although at render time, I duplicated this and simply applied a glass shader to it to give me a nice specularity and reflection).


Fig.08

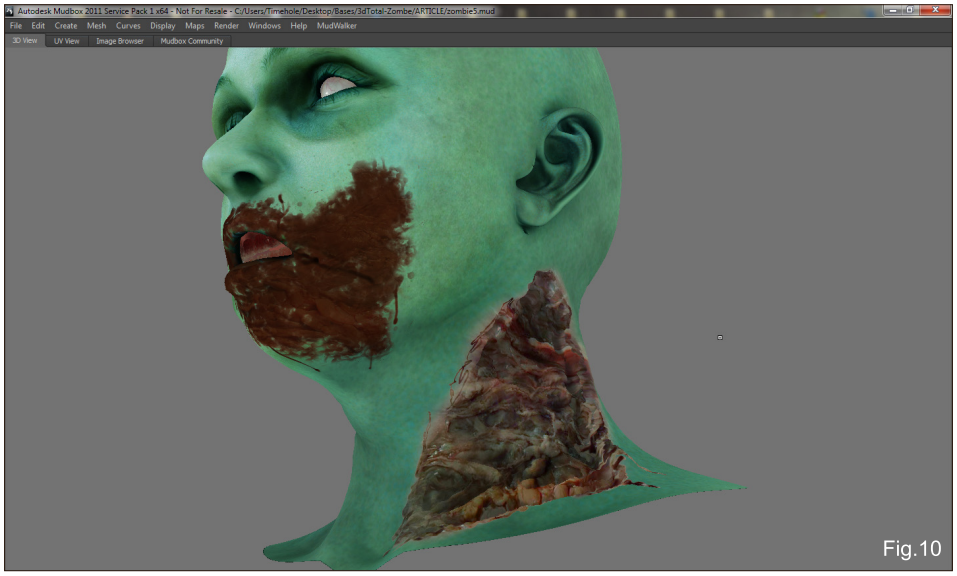
FACES OF THE DEAD

As mentioned your average zombie isn't big on smiling, mainly as they are dead. Also although animated they don't have a whole lot of motor control. Unless we class some modern films that seem to give zombies super powers on death, the ability to run four x normal speed and jump high buildings in a single bound. These in my opinion are not zombies, they are... well I'll spare you my opinion.

What I am getting at is that if we assume that only basic motor control is present then the face (and rest of the body) will droop, sag and look like they have the worst hangover in history (**Fig.09**). All facial muscles will sag downwards and lose their "pertness'" (I'm not sure if that word is a real word or not, if not it is now) (**Fig.10**). We must sculpt in some sag and also sculpt in a bit of depth to the eyes and some of the bone structure. I didn't want to push this stage too far as you can suddenly end up with a zombie that looks like it's a skeleton with skin on it (thus meaning not enough muscles to believably motor around the body).

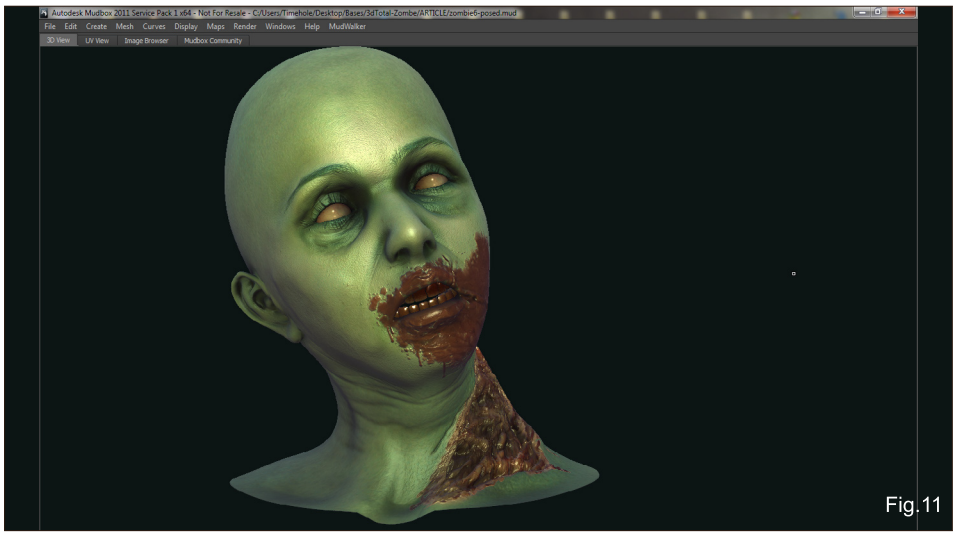

Fig.09

How far you personally want to step in that direction is up to you, but I felt more restraint was needed to keep this believable and not stray too far into comic book zombie territory.


Fig.10

"DEM BONES DEM BONES DEM MUDBOX BONES"

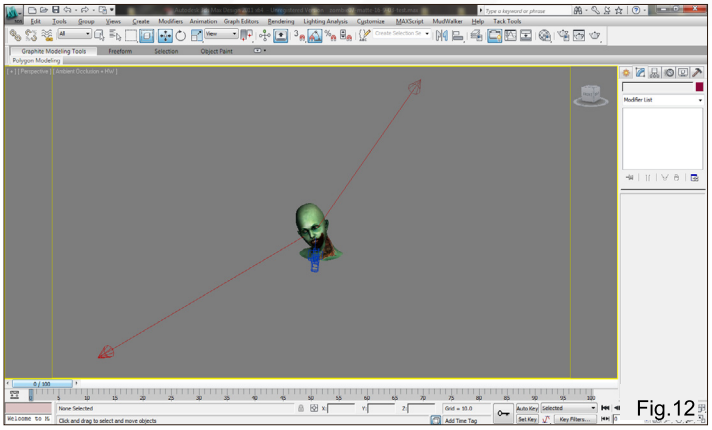
Sorry about the title of this section but I couldn't resist it. We can now use Mudbox bones to pose the mesh. So step down to a lower subdivision level and by right clicking on your right camera in your object list go to Look Through. Draw your bone along the jawline so that we can open the mouth. This area will require some weight painting unless you're very lucky (**Fig.11**). Just watch the video and you'll see the tricks I used to get those hard to reach places.

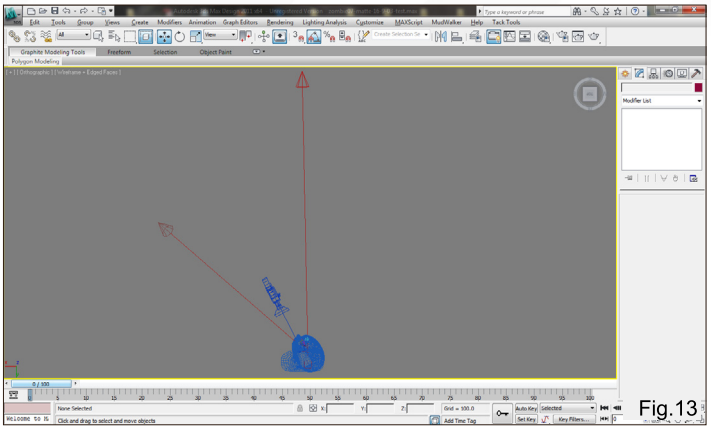

Fig.11

Once the mouth is both opened and corrected I can then pose the head itself in a similar fashion. Always remember to exit your bone/posing mode by selecting a Sculpting tool before drawing another bone. If you don't then it will simply redraw the bone you've just been using. I put her head to one side as I was already thinking ahead to the final render and its framing, as she has that nice bite to her neck I assumed this would weaken the neck a bit (the muscle would be missing or damaged) so the head would helpfully flop to one side. This is also a classic George Romero pose so I couldn't resist this small homage to the man.

"IT'S TIME FOR YOUR CLOSE UP MISS ZOMBIE!"

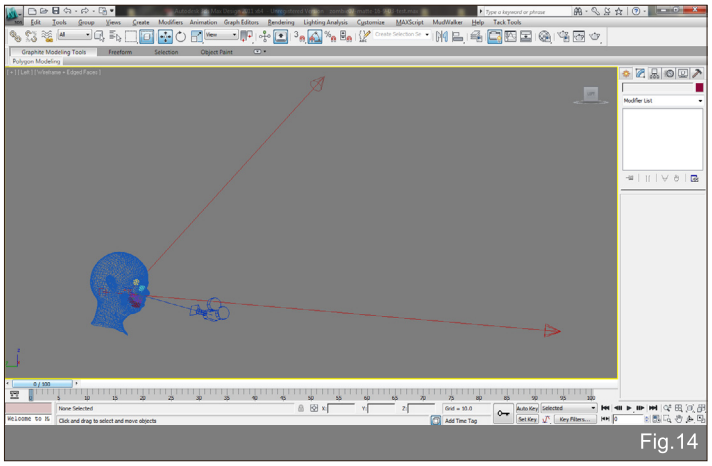
Ok so we have it all ready for render time and you have hopefully extracted a vector displacement map in either object or world

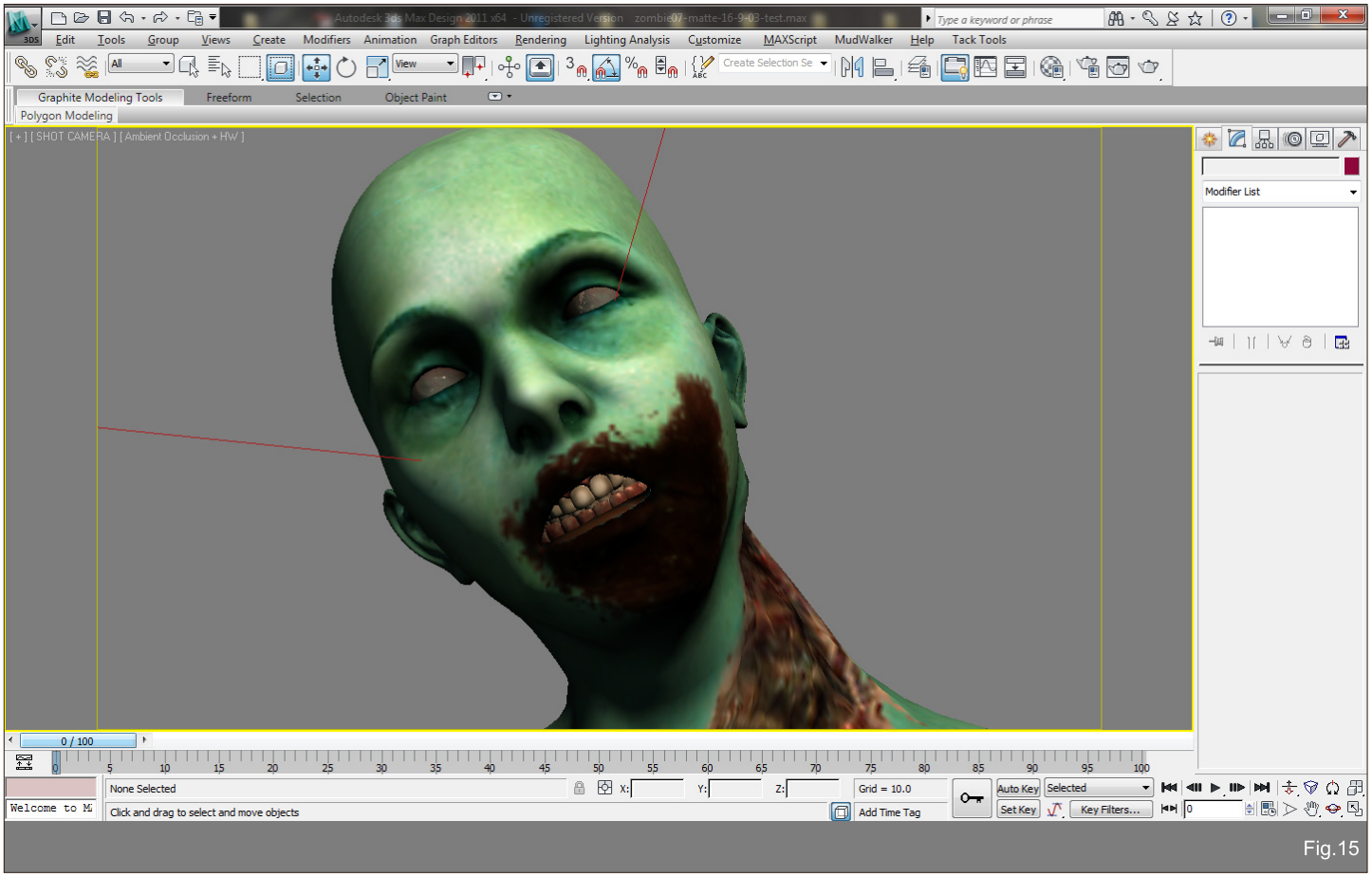

Fig.12


Fig.13

space and have “Wayne’s vector displace shader” installed and ready (you can get this free for 3ds Max, Maya and Softimage on www.PsychoCore.com). For me outdoor sunlight is simply not going to cut it for a image of a zombie (**Fig.12**). No doubt a zombie could theoretically go out in the daylight, but it’d just look so wrong to me. So I went for a simple two-point light setup. Yes, two-point (**Fig.13 –14**).

This is a three-point light setup with the rim light chucked out of the nearest window and a low fill light. The rest of the work is done by our main light. This also cuts down on hair rendering time. I always switch off every light except my main light for the hair render pass and composite this later (**Fig.15**). My top hair rendering tip is when you do a render in

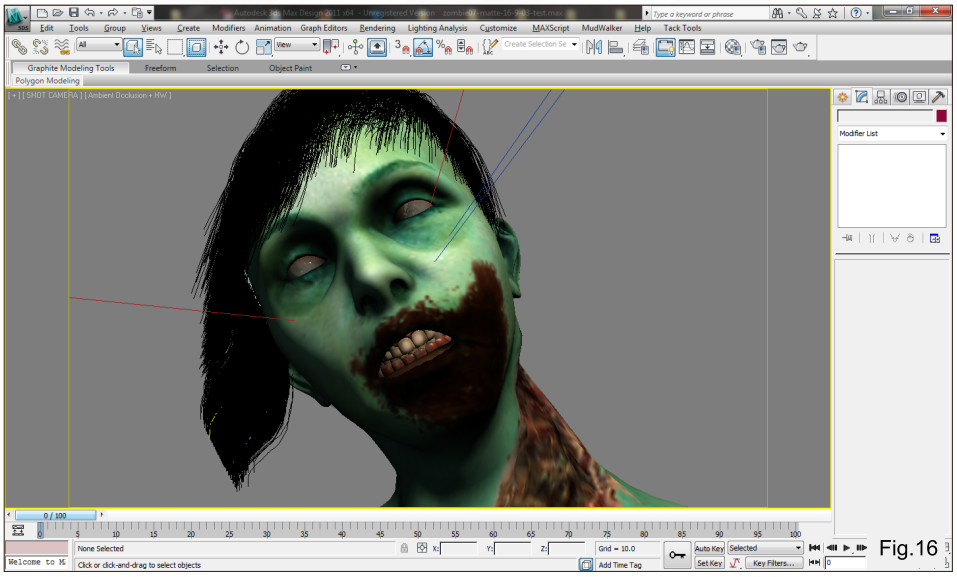

Fig.14

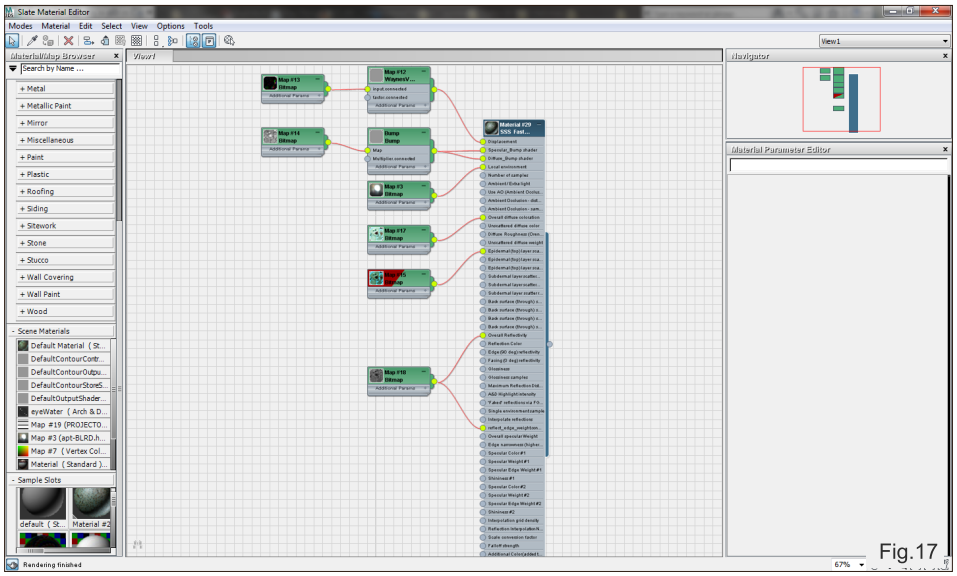

Fig.15

Max of just the hair to put a simple flat standard shader on everything that isn't hair. This renders faster than the whole thing in passes (**Fig.16**).

The shader is a one of my good mates Zap Andersson's called the SkinPlus + shader and can be found on his site www.mentalraytips.com. I used it in this case as I needed that powerful spec and gloss and reflections that are far harder to get with the standard Fast Skin SSS (**Fig.17**). It also adds a nice ambient occlusion in for free as part of the shader thus saving a little work.

As for the post work I'll let the video outline that, although it's fairly minimal and just some basic colour corrections. I would say when framing your shot, learn at least a little about composing a shot, or failing that replicate to some degree a nice film or still shot that fits the mood of your scene.


Fig.16


Fig.17

IN CLOSING

This has to be the most surreal article I've ever written for obvious reasons. I don't think they realised what they were letting themselves in for asking me to do a zombie. But my stance is simple: always use the best reference that is available. Sometimes that reference is going to be things that you either don't like or would never normally look at. Not everyone can or wants to do it the way I have from real life (or real death depending on how you look at it), images. For me it makes a lot of sense. But in closing I'd like to give a warning. This is what I term the dark side of art as the references could take you to some places that contain truly horrific images. I'm glad next month we get to do a vampire. I like vampires; vampires are cool. So next time for once a vampire is far happier a subject (**Fig.18 – 19**).


Fig.18

WAYNE ROBSON

For more from this artist visit:
http://www.dashdotslash.net/
Or contact them at:
wayne@dashdotslash.net



Fig.19

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Rig Creation – Part 1

Chapter 4 | July Issue 059
Rig Creation – Part 2

Chapter 5 | This Issue
Rig Creation - Part 3

Chapter 6 | Next Issue
Facial Rigging and Scripting



INTRODUCTION TO RIGGING

The aim of these tutorials is to show and explain how you might tackle rigging your 3D character for animation. These tutorials will give help and advice to novices and experts who are looking to build on their rigging skills or approach rigging for the first time. The series gives a detailed step by step guide as to how to approach rigging but also shows us how to tackle common problems and issues that regularly occur even in a professional environment. The artists will be reflecting on working in the industry as well as talking us through their individual approaches to creating the best rigs possible.

DOWNLOAD RESOURCES

This download includes
- Free Scene Files
- Free Macro Scripts

INTRODUCTION TO RIGGING: 5 - RIG CREATION - PART 3

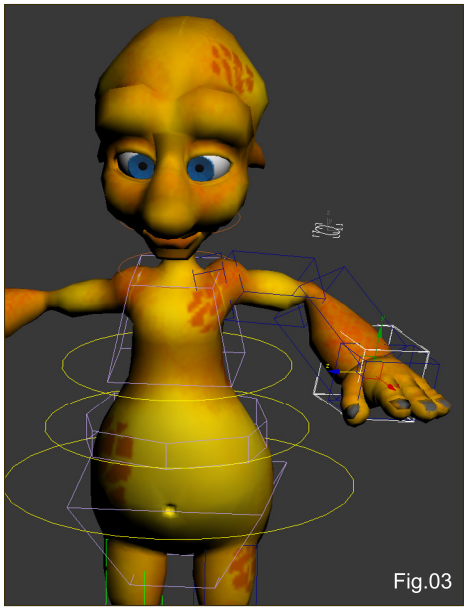
Software used: 3ds Max

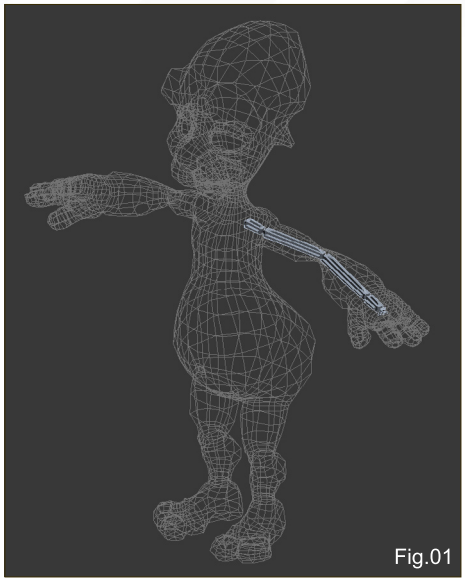
CHAPTER OVERVIEW

Welcome to the fifth chapter of the Introduction to Rigging Tutorial Series for Max. In the previous chapters we rigged the spine, neck, head, eyes and legs of the character. In this chapter we are going to continue with the rigging of the character - working on the arms and fingers.

Note: This tutorial has been done with Autodesk 3ds Max 2010, but it can be followed with previous versions of Max (until 3ds Max 7; previous versions would lack the necessary tools). If we use specific tools only available in Max 2010, we will mention them and we will explain how to make something similar with previous Max versions if needed.

Note: During this chapter you will find the word Maxscene followed by the name of the Max file. These Max scene files are provided with this tutorial and the files are created to illustrate the lessons. Remember to move the time slider, as a lot of them are done with animation to illustrate the examples better. The files have been created in Autodesk 3ds Max 2010 so


Fig.03


Fig.01

can only be opened with this version of Max or newer ones.

Note: As we explained in the previous chapter, we are using macroscripts; to install this option just follow the instructions in the third chapter. There will be a small readme.txt that will explain again the installation in case is needed.

We are not going to explain each new macro. They will be properly explained the first time we mention every macro. After that, we will only say to use a macro - we will not explain what it does. Lots of macros have been explained in previous chapters.

ARM ANIMATION RIG

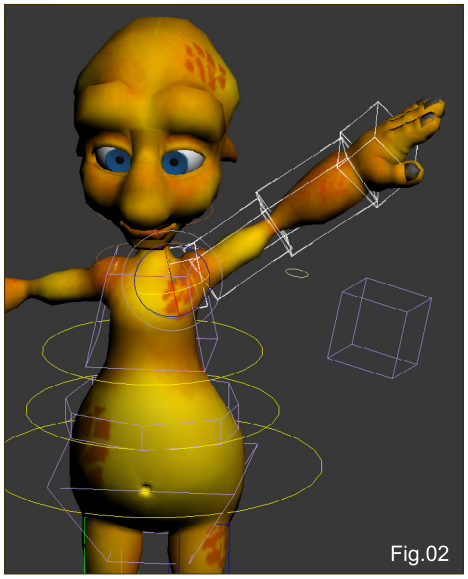
BONES

We just need four bones for each arm, one for each main area - shoulder, upper arm, forearm and hand.

In reality an arm has many more bones but this simplification will help us with the rigging. And with these four bones we can achieve what is needed for a good animation rig (**Fig.01**).

CONTROLS

For the arm controls we have to distinguish between IK and FK. We will have an attribute to blend in between both.


Fig.02

FK Controls

These are controls that we always use on FK. So to achieve the desired poses we just rotate the objects. The arm FK rig has a shoulder, upper arm, forearm and hand (**Fig.02**).

IK Controls

The main control in the IK system is the IK control for the Arm. Moving this means we control the forearm and upper arm, and rotate the orientation of the hand. The IK has attributes for changing from FK to IK.

The other control is the IK swivel target. The elbow of the arm will be always be pointing at the control and we always use this control together with the IK main control (**Fig.03**).

CREATION OF THE ARM RIG FK

Open Maxfile: 2.3_Alien_ArmFK_01.max to be at this stage.

1) Hide the layers Controls, and be sure your active layer is 0 (default).

2) We will start by creating the bones. Where we place the joints is important and it will help to achieve proper deformations. Be sure you start drawing the bone chain from the front view, to have the correct orientation. Once created, move and rotate them into place in the rig point;

if you need to edit where the bone is, use the bone tool mode edit pivot point.

Now check the bones are centred in the middle of the mesh for each view. Be sure that the shoulder, upper arm, forearm and hands are properly placed for all the views (**Fig.04 – 05**).

3) Rename the bones, starting from the shoulder: Alien_L_Arm_Shoulder__BH, Alien_L_Arm_Upper__BH, Alien_L_Arm_Fore__BH, Alien_L_Arm_Hand__BH.

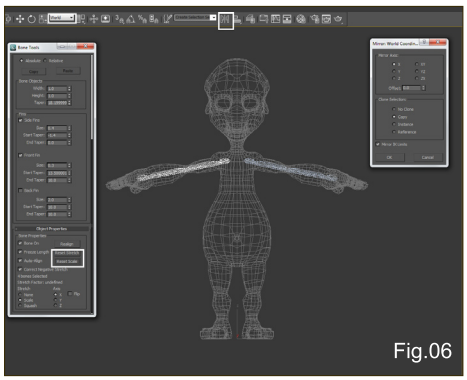
4) Now create the bones for the other side: the right arm. We could do them manually but it will not match the other side perfectly. So instead, use the Symmetry tool. Before using this tool, make sure the coordinates are in the world setting and the coordinates for manipulating the object are in the centre. By doing this the mirror will happen in the world setting.

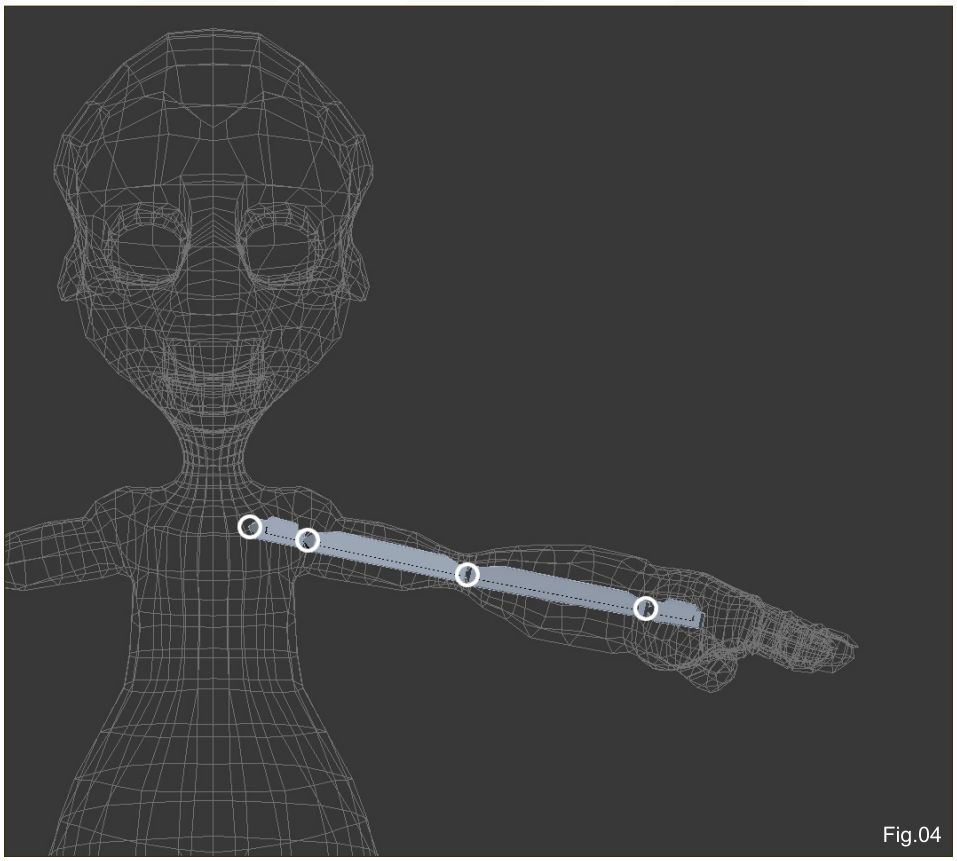
Mirror the X coordinates and make a copy. The Max Symmetry tool works by creating negative scales that are not good for rigging, so we use the bone tool options Reset Stretch and Reset Scale for the new objects.

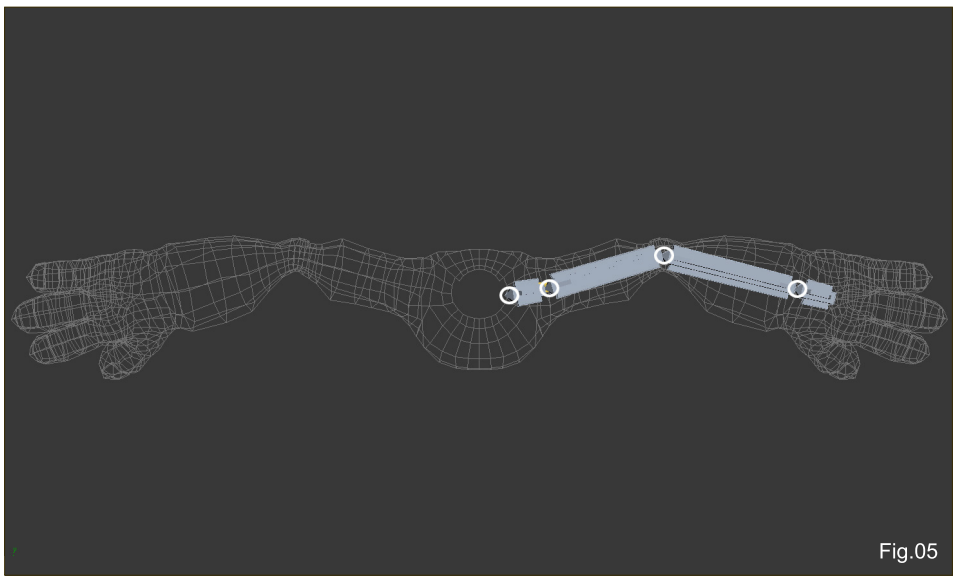
Remember to rename the bones to "R_". To do this use the IMR DialogName with the copy and paste inverse (**Fig.06**).

Open Maxfile: 2.3_Alien_ArmFK_02.max to be at this stage.

5) Now create the rig for the left arm. You have to repeat the process we just did for the right side. You can hide the bones of the right side if you want to focus on the left side.


Fig.06


Fig.04


Fig.05

6) Select shoulder and apply *IMR Point Parent*. Name the point Alien_L_Arm_Parent__DH

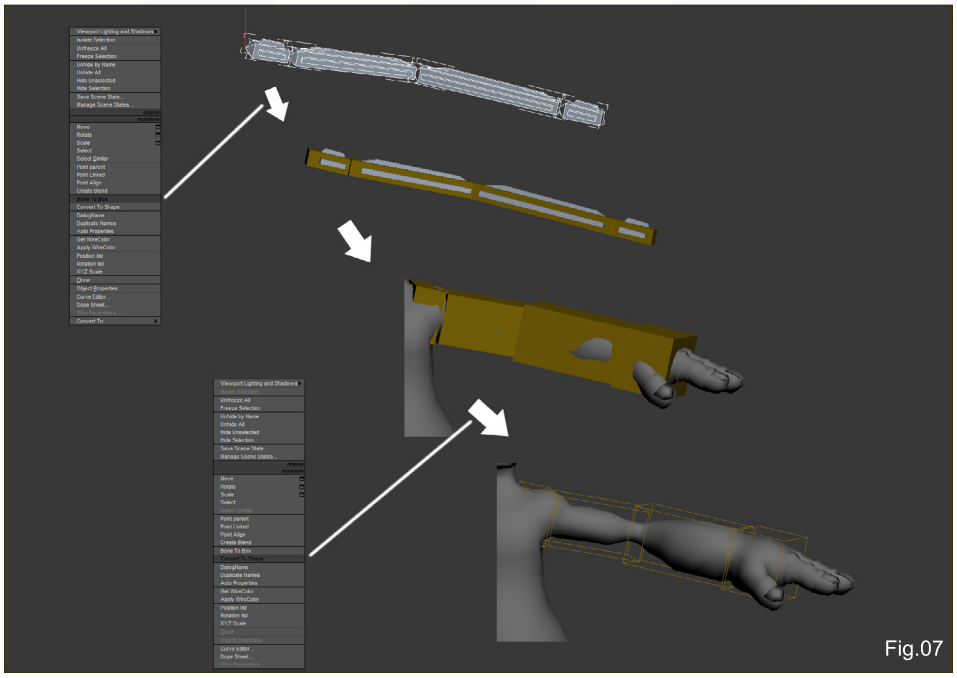
7) Before we continue with the rig for the FK arm, clone the forearm, upper arm and hand of the IK rig and rename the cloned bones: Alien_L_Arm_IK_Upper__BH, Alien_L_Arm_IK_Fore__BH, Alien_L_Arm_IK_Hand__BH. We will hide the cloned bones now and unhide them when we do the IK rig.

8) We will use a similar technique to the one we used to create the FK control for legs.

9) Select the shoulder, upper arm, forearm and hand and apply IMR *Bone to Box*.

10) Change the width and height of the boxes to match the size of the geometry.

11) Select the four boxes and apply the *IMR Convert to Shape* (**Fig.07**).


Fig.07

12) Name the splines as follows: Alien_L_Arm_Shoulder__SA, Alien_L_Arm _FK_Upper__SA, Alien_L_Arm_FK_Fore__SA, Alien_L_Leg_FK_Hand__SA. Apply a blue wire color to the shapes.

13) The splines that have been created are not parents. So redo the hierarchy, making the shoulder the parent and the hand the last child. Link Alien_L_Arm_Shoulder__SA to Alien_L_Arm_Parent__DH

14) Apply IMR rotation list to Alien_L_Arm_Shoulder__SA, Alien_L_Arm _FK_Upper__SA, Alien_L_Arm_FK_Fore__SA, Alien_L_Leg_FK_Hand__SA and make it not keyable then position and scale (**Fig.08**).

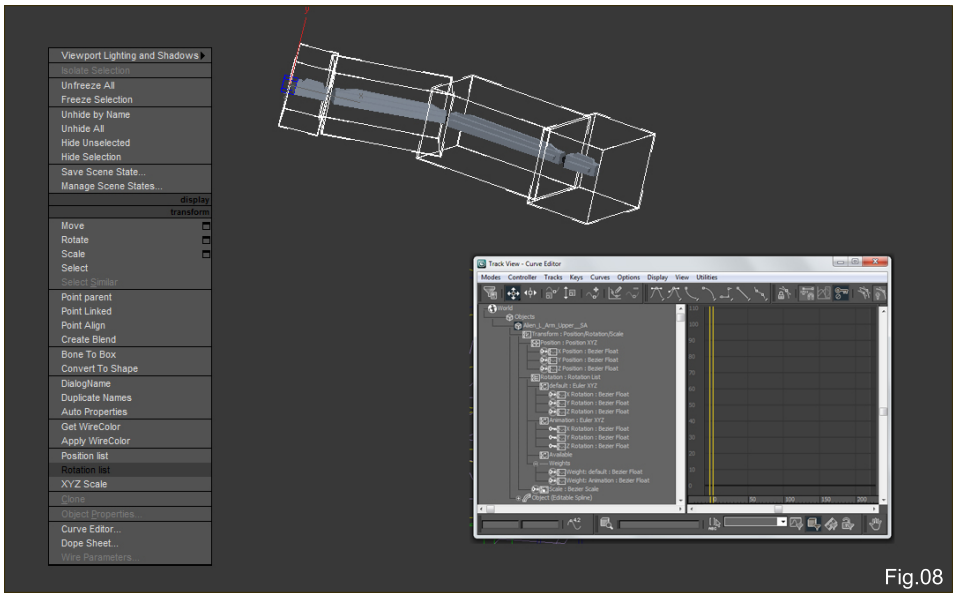
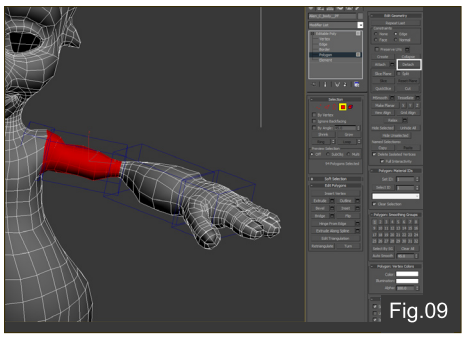


Fig.08

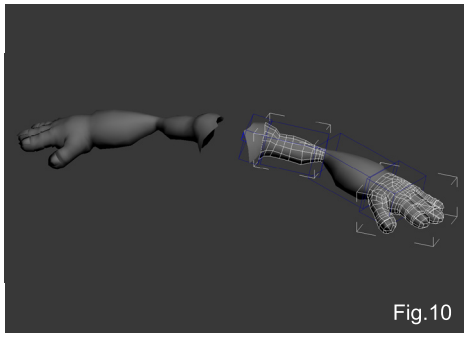
Open Maxfile: 2.3_Alien_ArmFK_03.max

15) Link Alien_L_Arm_Shoulder__BH to Alien_L_Arm_Shoulder__SA.
Link Alien_L_Arm_Upper__BH to Alien_L_Arm _FK_Upper__SA.
Link Alien_L_Arm_Fore__BH to Alien_L_Arm_FK_Fore__SA,.
Link Alien_L_Arm_Hand__BH to Alien_L_Leg_FK_Hand__SA.

16) Unhide the hidden layer and link Alien_L_Arm_Parent__DH to Alien_C_Spine_Chest_sk__BH, so now the arm will follow when the body moves. After you have done the linking, hide the layer again.


Fig.09

17) Now create the proxy for the arm - clone Alien_C_body__MF as a copy and rename it to Alien_C_body__PF. In Alien_C_body_PF make sure to clean the stuck deleting skin and later in Edit Poly, detach the proxy for each part of the arm. Leave the mesh that we will need later to create the proxy for the right side (**Fig.09**).


Fig.10

Name the cut mesh Alien_L_Arm_Shoulder__PF, Alien_L_Arm _Upper__PF, Alien_L_Arm _Fore__PF, Alien_L_Leg _Hand__PF and link them to the controls (**Fig.10**).

18) Now move "*_Arm_*__PF" to the proxy layer. Unhide the Layer Controls and Proxy. Use IMR get wire color to copy from the body and

IMR Apply wirecolor to paste the wirecolor for the proxy objects of the arm (**Fig.11**).

Note: In the previous chapter we didn't apply the wirecolor to the proxy of the legs, so please apply the wirecolor to the legs too.

19) In the proxy objects Alien_C_Spine_Chest__PF and Alien_L_Arm_Shoulder__PF get geometry on top of each other. Delete the duplicate faces in Alien_C_Spine_Chest__PF.

Open Maxfile: 2.3_Alien_ArmFK_04.max to be at this stage.

With this we have finish the FK rig. Now you can test and rotate the control for the arm and be sure that they follow the body. We can always reset the controllers to the default by using IMR Keytools.

Creation of the arm Rig IK

1) Hide the layers Controls, Proxy and Mesh. Hide all the objects in layer 0 (default) except the objects Alien_L_Arm_Shoulder__BH , Alien_L_Arm_IK_Upper__BH, Alien_L_Arm_IK_Fore__BH and Alien_L_Arm_IK_Hand__BH.

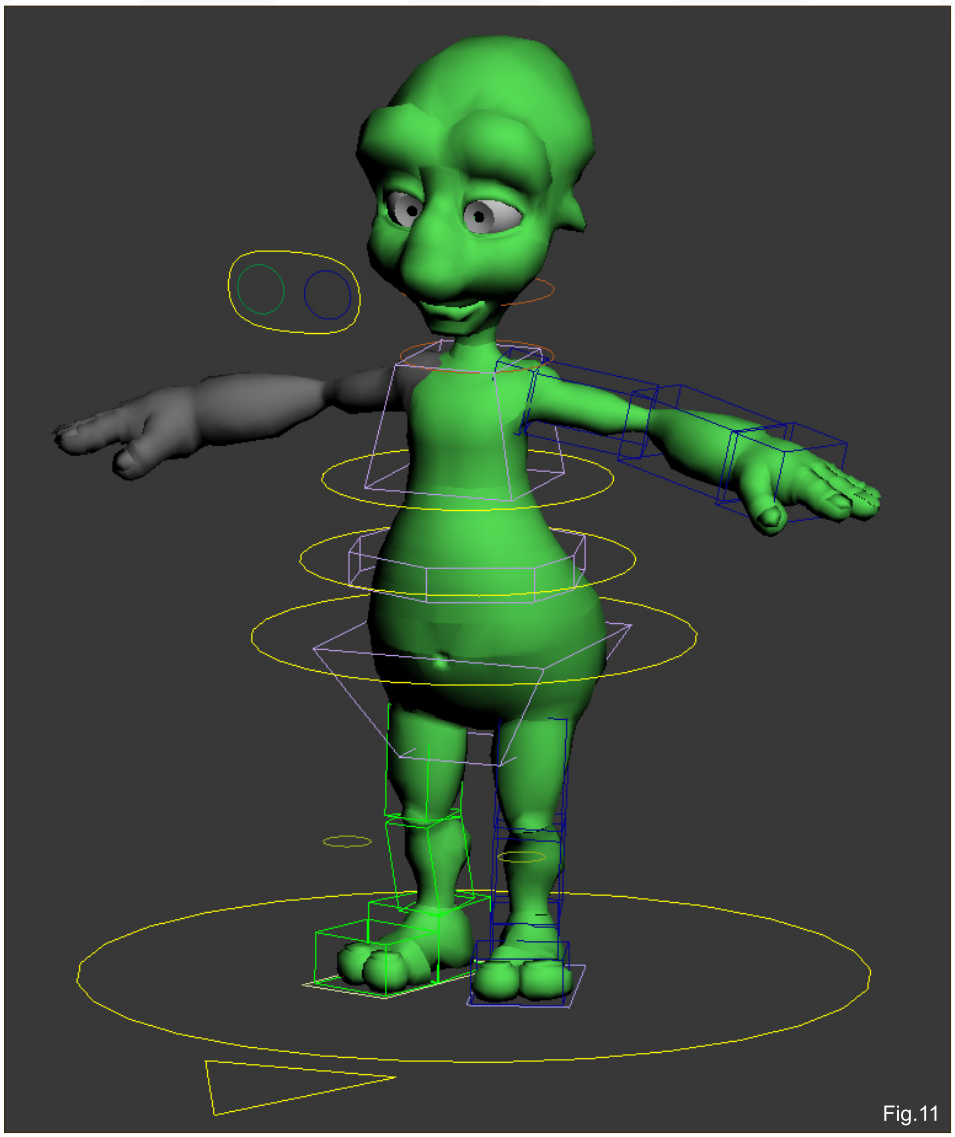
2) Apply IMR Point align to Alien_L_Arm_IK_Hand__BH.

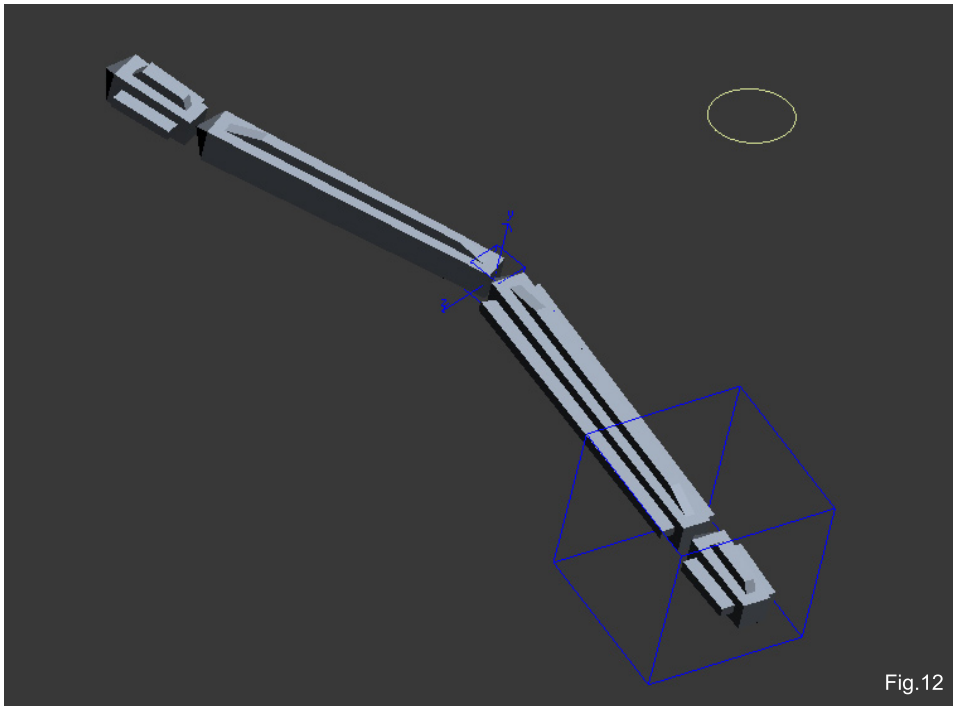
3) Select Alien_L_Arm_IK_Upper__BH and Alien_L_Arm_IK_Fore__BH and apply IMR create blend.

4) Create a curve spline and align and link it to the blend point you just created. Move the spline to position Z to separate it from the elbow area and name the circle Alien_R_Arm_IK_swivel__SA (**Fig.12**).

5) We can delete the blend point we just created to help place the circle shape for the swivel.

6) Convert the point for the hand to a spline with IMR Convert to Spline and name it Alien_R_Arm_IK __SA.


Fig.11


Fig.12

7) Apply an IK solver HD solver from L_Arm_IK_Upper__BH to L_Arm_IK_Hand__BH.

8) Name the IK L_Arm_IK __BH and make the swivel of the IK Alien_R_Arm_IK_swivel__SA.

9) Apply an orientation constraint to L_Arm_IK_Hand__BH, the target being Alien_R_Arm_IK __SA.

10) Link L_Arm_IK __BH to Alien_R_Arm_IK __SA.

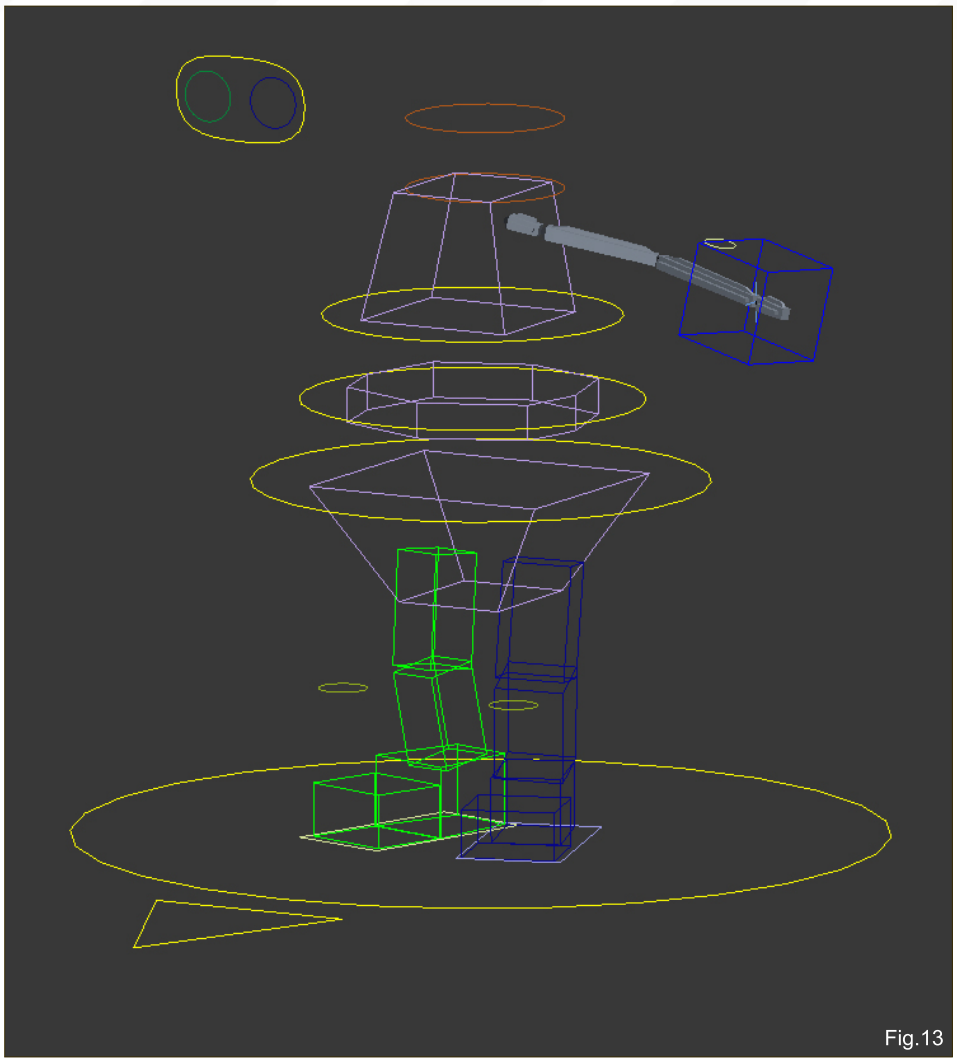
11) Unhide the Controls layer and link Alien_R_Arm_IK __SA and Alien_R_Arm_IK_swivel__SA

12) Apply an IMR Rotation list to Alien_R_Arm_IK __SA

13) Apply an IMR Rotation list to Alien_R_Arm_IK __SA and Alien_R_Arm_IK_swivel__SA (**Fig.13**).

Open Maxfile: 2.3_Alien_ArmIK.max to be at this stage

By doing this we have finished the IK rig. Now you can test and rotate and move the control for the IK arm. We can always reset the controllers to default by using the IMR Keytools.


Fig.13

Connect the FK Rig to the IK Rig

As we did on the legs in the previous chapter, we have to make the FK chain follow the IK chain, but with the option to not follow it as well. To do so we will use a combination of Orientation Constrain and Float List.

1) Unhide the control for the FK of the arm, Alien_L_Arm_Shoulder__SA, Alien_L_Arm_FK_Upper__SA, Alien_L_Arm_FK_fore__SA and Alien_L_Arm_FK_Hand__SA.

2) Select Alien_R_Arm_IK__SA and add an Attribute Holder in the modifier panel

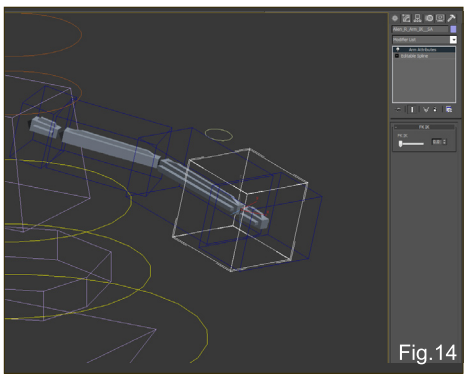
3) Load the script LArm_Attributes_ApplyCA.ms. You can find the script in the max_script folder accompanying this chapter. Evaluate the script. After the script is evaluated rename the attribute holder to Arm Attributes (**Fig.14**).

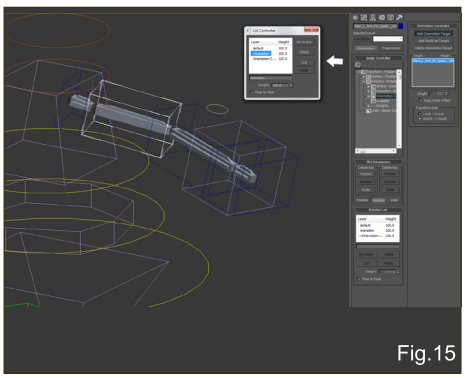
4) On the object Alien_L_Arm_FK_Upper__SA, on the float list of rotation add an orientation constraint in the available, the target will be Alien_L_Arm_IK_Upper__BH.

5) Once the orientation constraint has been set up, set the active channel to the animation on the list (**Fig.15**).

6) For the object Alien_L_Arm_FK_fore__SA, on the float list of rotation add an orientation constraint in the available, the target will be Alien_L_Arm_IK_Fore__BH.

7) Once the orientation constraint has been set up, set the active channel to the animation.


Fig.14


Fig.15

8) For the object Alien_L_Arm_FK_Hand__SA, on the float list of rotation add an orientation constraint in the available the target will be Alien_L_Arm_IK_Hand__BH.

9) Once the orientation constraint has been set up, set the active channel to the animation on the list.

10) If we now move the IK, the FK will follow. For each of the three FK controls we put the weight of the orientation constrain value to 0, so the FK will stop following the IK.

When the weight of the channels is set to 0 in the three controls, we can rotate the objects because we have active on the rotation list in animation.

11) Connect the Alien_L_Arm_IK__SA attribute FKIK to the weight for the orientation constraint in the rotation list for the three controls Alien_L_Arm_FK_Upper__SA, Alien_L_Arm_FK_Fore__SA and Alien_L_Arm_FK_Hand__SA (**Fig.16**).

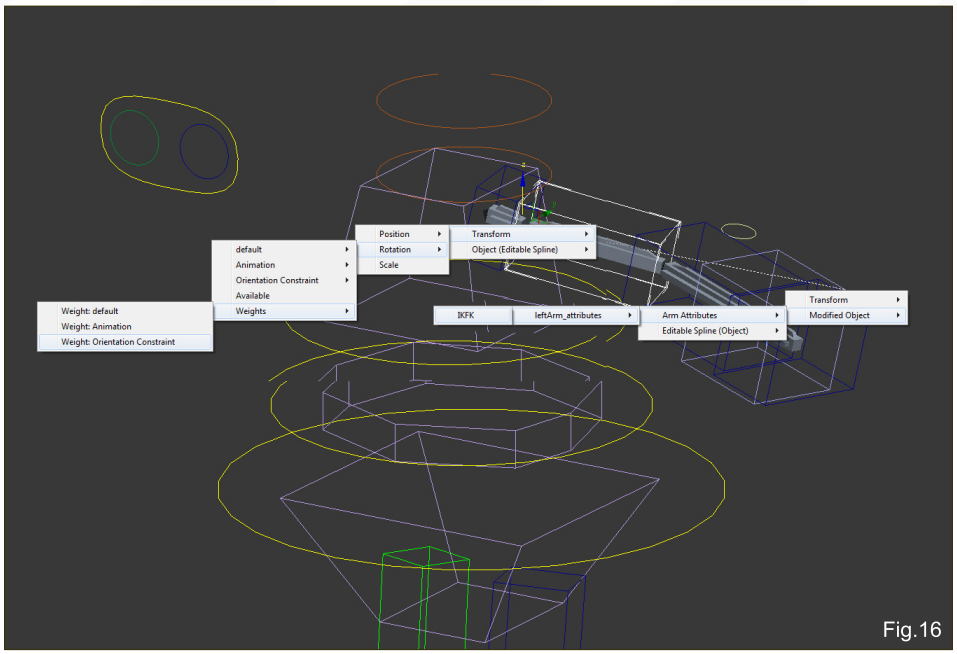


Fig.16

Open Maxfile: 2.3_Alien_Armblend.max to be at this stage

12) Move the IK up and you will see that the FK doesn't follow. If we move the attribute of the FK IK to 1, the FK will now follow the IK (**Fig.17**).

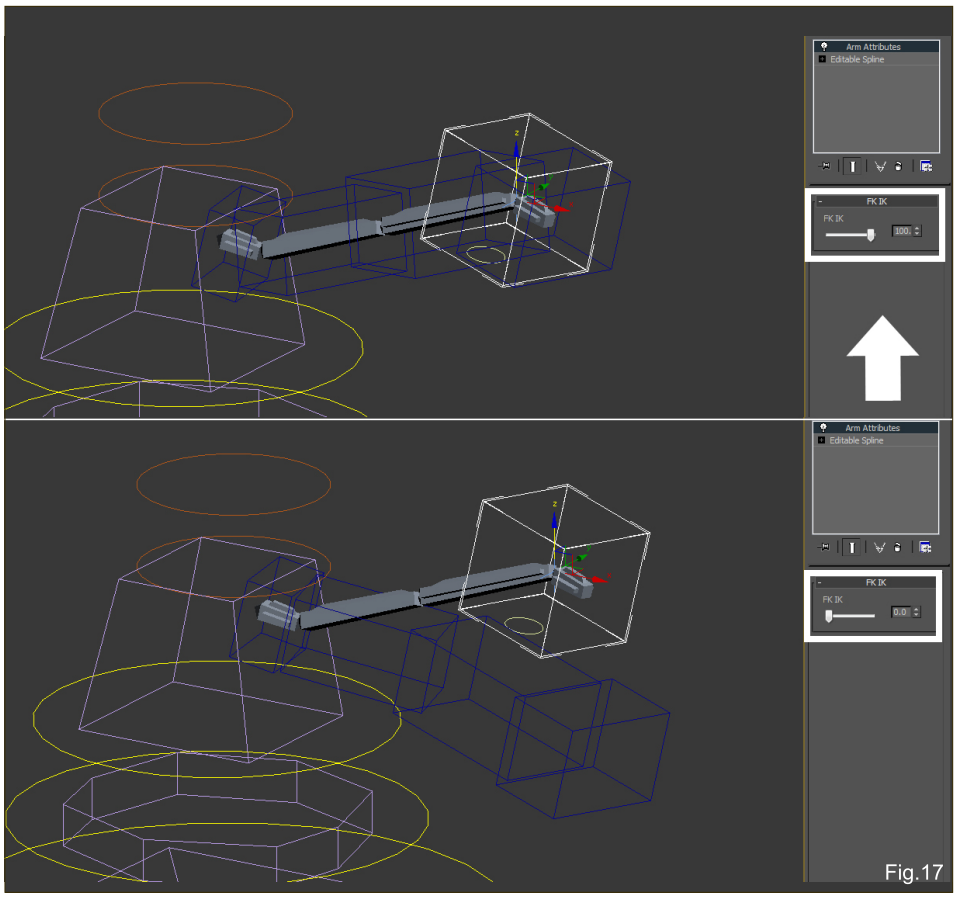


Fig.17

CHECKLIST FOR THE ARM RIG

Before we move on to another part of the rig it is good to do a checklist for rigging. There are always too many things to remember to chec and using this checklist will make things easier.

1- Proper names
2- Proper names for the layers
3- Objects in their correct layers
4- No object in layer 0
5- No duplicate names
6- Move the master and check all the meshes follow correctly
7- Controls have correct rotation orders
8- Limited keyability in controls and proper locks
9- Rotate and move the rig with autokey to check all is ok
10- Delete keys and leave a clean version for animators
11- Be sure IMR keytools zero all work properly

We will not examine all of the points above, only the most important.

3- Objects in their correct layers

Remember to use "*_L_Arm_*__*H" to move objects to the hidden layers, "*_L_Arm_*__SA" to move objects to the Controls layers and "*_L_Arm_*__PF" to move objects to the Proxy layer.

8- Limited keyability in controls and proper locks

Alien_L_Arm_IK__SA is keyable in rotation/animation position/animation and locked scale.

Alien_L_Arm_Shoulder__SA is keyable in position/animation and locked in rotation and scale.

Alien_L_Arm_IK_swivel__SA is keyable in rotation/animation and locked in position and scale.

Alien_L_Arm_FK_Upper__SA is keyable in rotation/animation and locked in position and scale.

Alien_L_Arm_FK_Fore__SA is keyable in rotation/animation/Y_rotation and locked in position and scale, and rotation_X and rotation_Z.

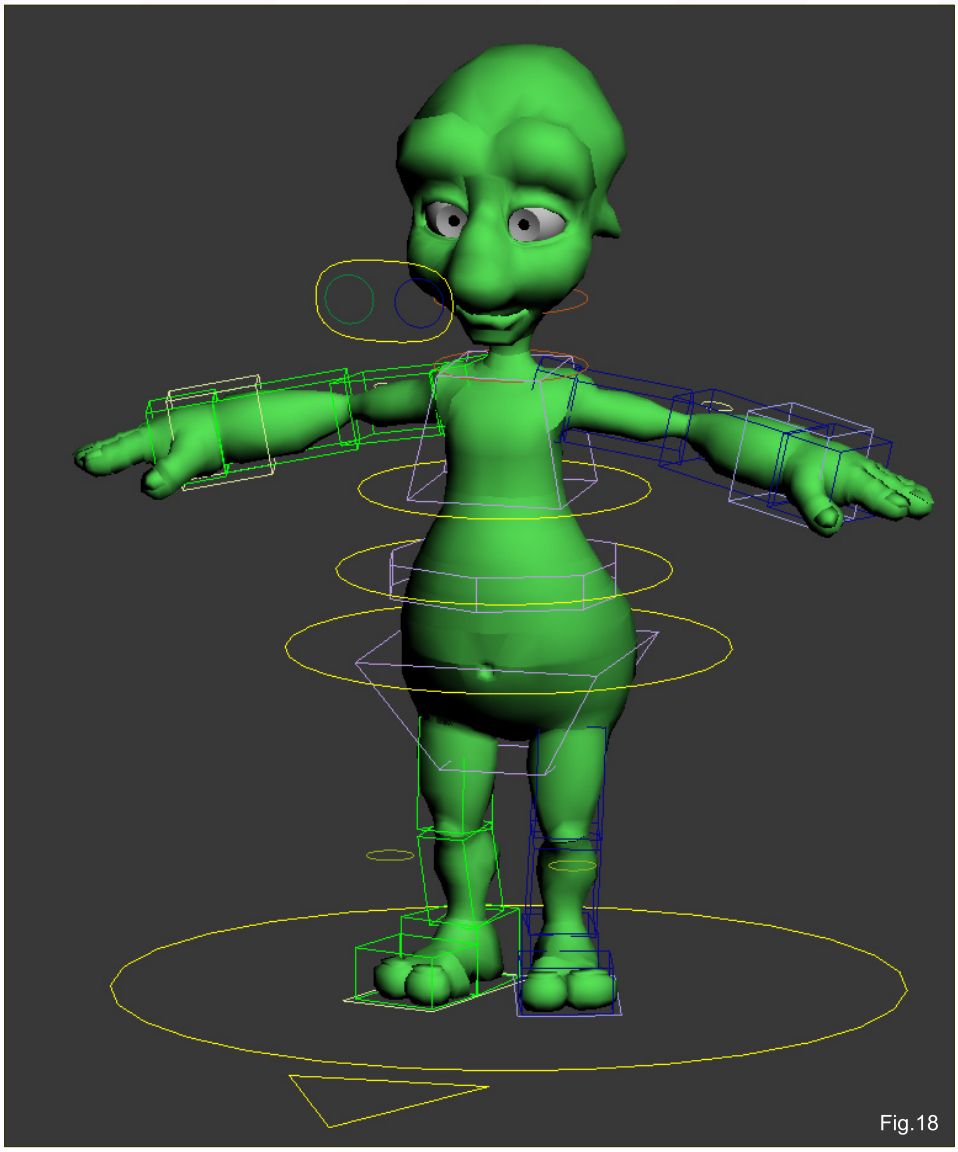
Alien_L_Arm_FK_Hand__SA is keyable in rotation/animation and locked in position and scale.

11- Be sure the IMR keytools zero all work properly

Open Maxfile: 2.5_Alien_ArmCheck.max to be at this stage.

Create the other side

We have created the left side. You will have to repeat the process for IK FK and connect the FK with the IK for the right arm. And finally do the checklist again for the right side (**Fig.18**).


Fig.18

Open Maxfile: 2.6_Alien_twoArms.max

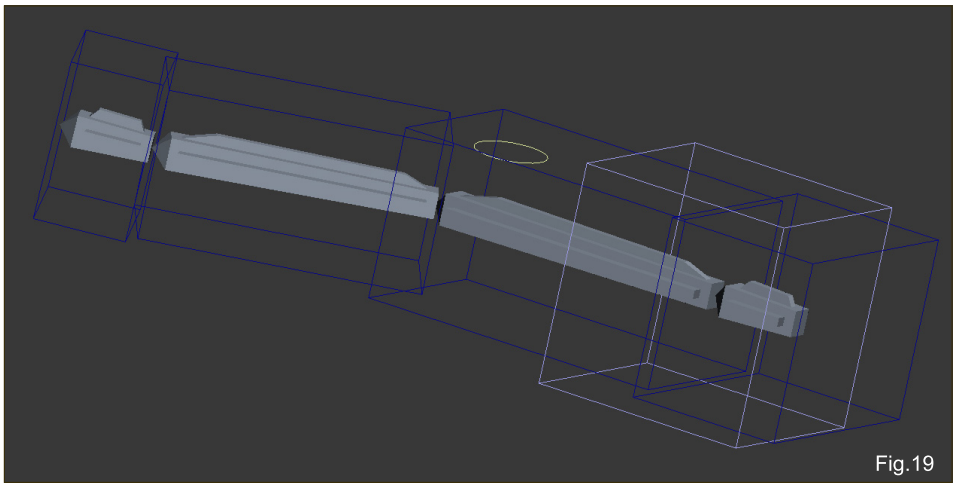
Now we have the rig for the arms ready and we can continue and focus on the deformation rig.

Arm Deformation Rig

Deformation Arm Rig

As we did with the animation, we will focus on one arm, the left side, and let you do the right side by yourself, following the same instructions we used to create the left.

Because the FK rig is the one that follows the IK, we will build the deformation rig following the FK rig. This way we will be sure that the deformation rig works with FK and IK.

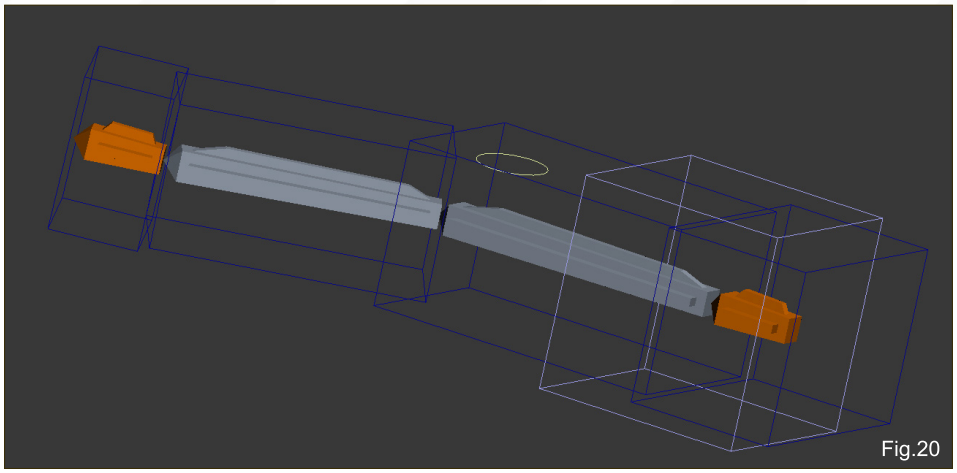

Fig.19

1) Hide the Proxy and Hidden layer. For the Control layer, we will only leave the control for the left arm.

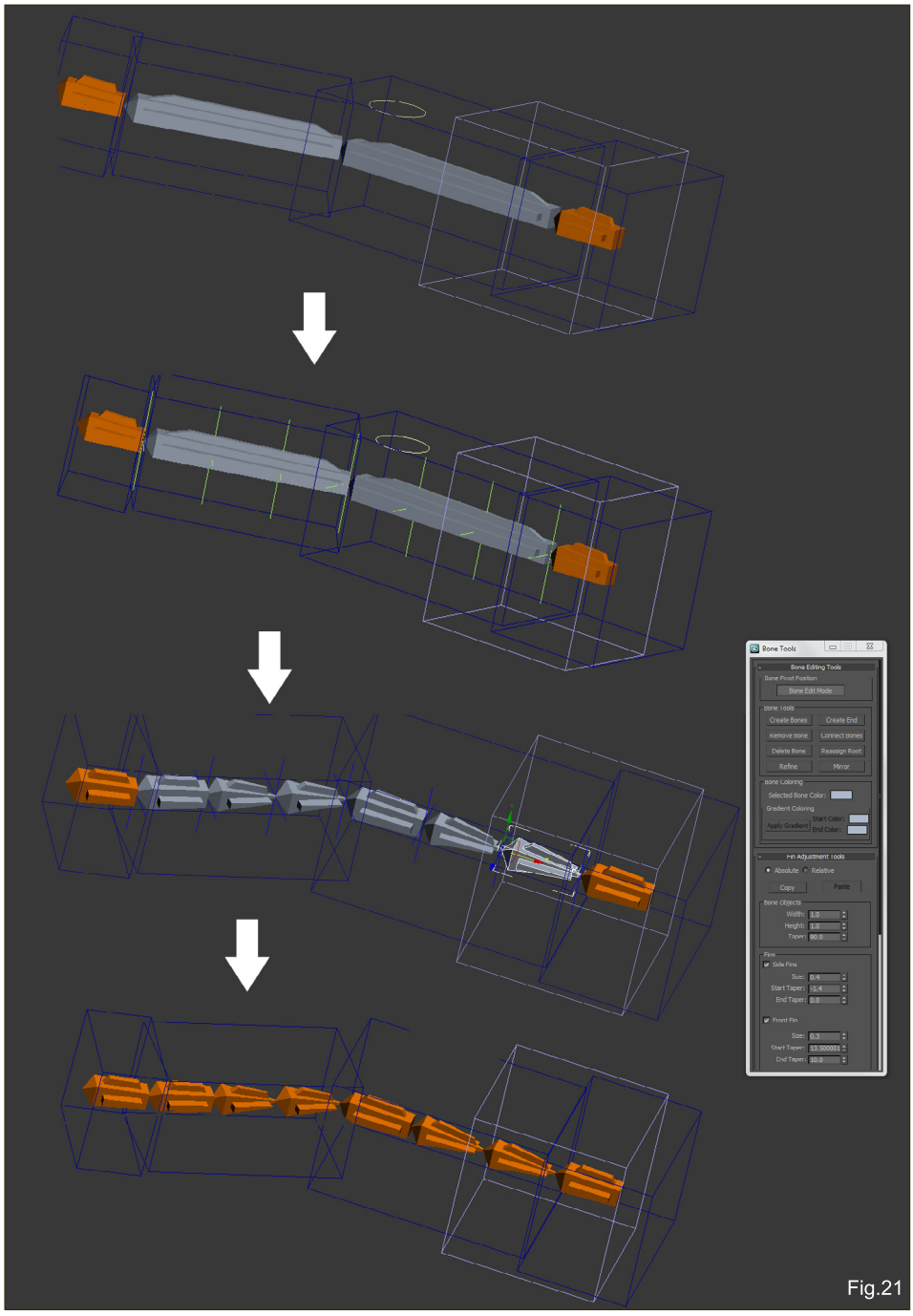
From the hidden layer we will move the objects Alien_L_Arm_Shoulder__BH, Alien_L_Arm_Upper__BH, Alien_L_Arm_fore__BH and Alien_L_Arm_Hand__BH to the layer 0 (default) (**Fig.19**).

Open Maxfile: 3.1_Alien_Arm_DR_01.max to be at this stage.

2) Rename Alien_L_Arm_Shoulder__BH to Alien_L_Arm_Shoulder_SK__BH, and Alien_L_Arm_Hand__BH to Alien_L_Arm_Shoulder_sk__BH and change the wirecolor to orange. We will use these two objects for skinning (**Fig.20**).


Fig.20

3) For the upper arm and forearm we will use the technique we used for the leg to create three twist bones, using four points to help create the three twist bones. Using Bone tools we can transform each bone into three bones and align them to the points. Once the twist bones have been created, we can delete the points as we only created them to help.


Fig.21

4) Put the wirecolor in orange and name the twist bones Alien_L_Arm_Upper_Twist01_SK_BH, Alien_L_Arm_Upper_Twist02_SK_BH, Alien_L_Arm_Upper_Twist03_SK_BH, Alien_L_Arm_Fore_Twist01_SK_BH, Alien_L_Arm_Fore_Twist02_SK_BH and Alien_L_Arm_Fore_Twist03_SK_BH. Link the twist bone to the upper arm and forearm (**Fig.21**).

Open Maxfile: 3.1_Alien_Arm_DR_02.max to be at this stage.

Note: If you don't want to repeat the same process to create the twist bones for the right side, use the Symmetry tool in world coordinates and later use the Bone tools to reset the stretch and scale. Remember to unlink the symmetry bones afterwards so they don't follow the left side.

5) Select Alien_L_Arm_Shoulder__SA and Alien_L_Arm_FK_Upper__SA and apply an /MR create Blend. Name the point Alien_L_Arm_Upper_Upnode__DH. Make the weight for the orientation constrain of the target Alien_L_Arm_Shoulder__SA 70% and for Alien_L_Arm_FK_Upper__SA 30 %.

6) Select Alien_L_Arm_FK_Upper__SA and Alien_L_Arm_FK_Fore__SA and apply an IMR create Blend. Name the point Alien_L_Arm_Elbow_SK__DH.

7) Select Alien_L_Arm_FK_Fore__SA and Alien_L_Arm_FK_Hand__SA and apply an IMR create Blend. Name the point Alien_L_Arm_Fore_Twist_Target__DH.

8) Apply a LookAt _constrain to Alien_L_Arm_Fore_Twist03_SK__BH, the target is Alien_L_Arm_Twist_Target__DH and the upnode Alien_L_Arm_Twist_Target__DH, and Y Y on the alignment.

9) Apply an orientation constraint to Alien_L_Arm_Fore_Twist02_SK__BH and the target will be Alien_L_Arm_Fore_Twist03_SK__BH and Alien_L_Arm_Fore_Twist01_SK__BH.

10) Apply a LookAt _constraint to Alien_L_Arm_Upper_Twist01_SK__BH. The target is Alien_L_Arm_FK_Fore__SA and the upnode Alien_L_Arm_Upper_Twist_Upnode__DH, and Y Y on the alignment.

11) Apply an orientation constraint to Alien_L_Arm_Upper_Twist02_SK__BH. The target is Alien_L_Arm_Upper_Twist03_SK__BH and Alien_L_Arm_Upper_Twist01_SK__BH.

12) Select Alien_L_Arm_Upper_Twist01_SK__BH and Alien_L_Arm_Shoulder_SK__BH and apply an IMR create Blend. Name the point Alien_L_Arm_Shoulder_SK__DH.

Open Maxfile: 3.1_Alien_Arm_DR_03.max to be at this stage.

With this we have finished the rotation twist. Rotate the FK control to check how the twists behave (**Fig.22**).

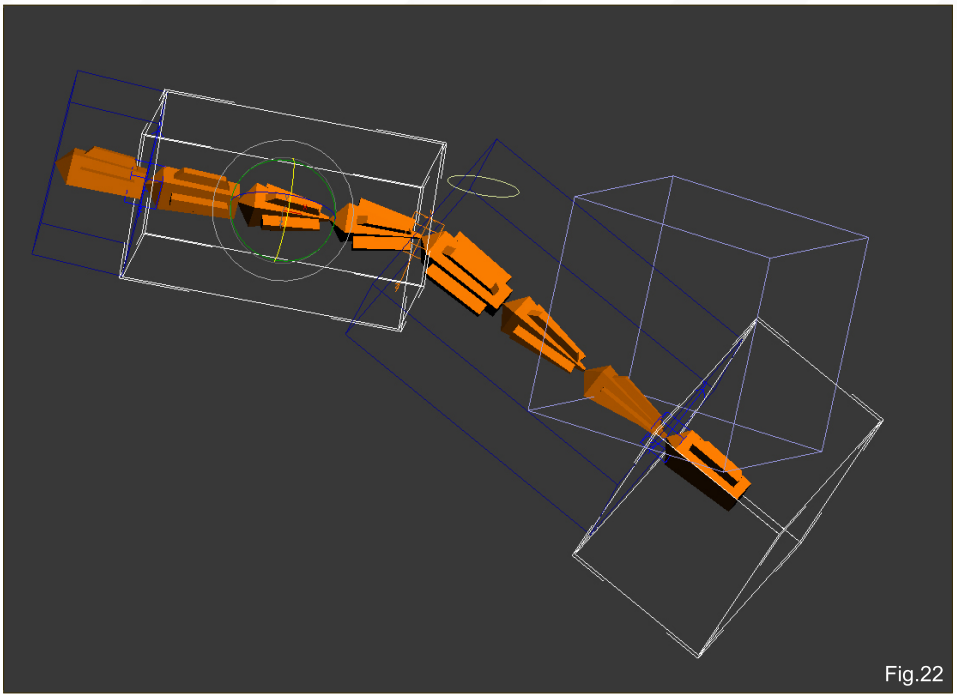


Fig.22

Checklist for Leg Deformation Rig

Before we move on to another part of the rig it is good to do a checklist for rigging. There are always too many things to remember to check. Using this checklist will make things easier.

1- Proper names
2- Proper names for the layers
3- Objects in their correct layers
4- No object in layer 0
5- No duplicate names
6- Move the master and check all the meshes follow correctly
7- Controls have correct rotation orders
8- Limited keyability in controls and proper locks
9- Rotate and move the rig with autokey to check all is ok
10- Delete keys and leave a clean version for animators
11- Be sure IMR keytools zero all work properly

We will not examine all of the points above, only the most relevant ones.

3- Objects in their correct layers

Remember to use "*_L_Arm*__*H" to move objects to the hidden layers.

Open Maxfile: 3.2_Alien_Arm_DR_check.max to be in this stage.

Create the Other Side

Now repeat the same process for the right side. If you did mirror the bones you will save a lot of work when creating the second side.

Open Maxfile: 3.3_Alien_Arm_DR_Bothsides.max

Skin

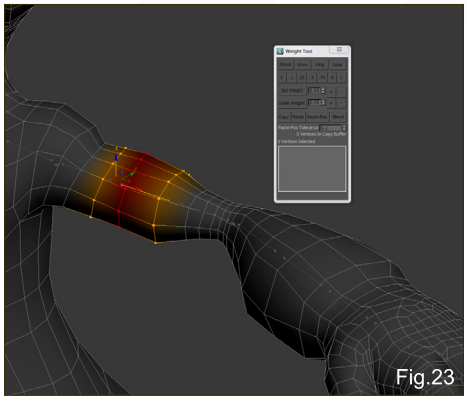
When we skin the arms, we will follow the same notes that we already used in the previous chapter.

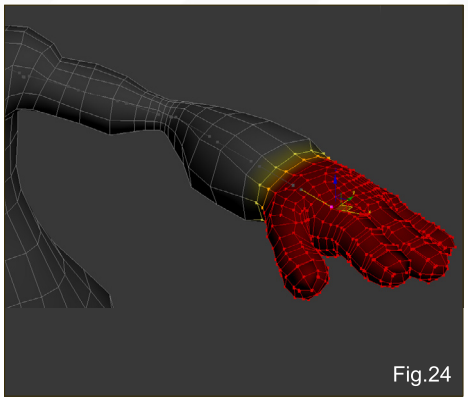
Note: To see the weight of the skin modifier better, go to the Command Panel display and set the mode for shaded in object color and the main body Alien_C_body__MF in grey.

Note: To avoid having the envelopes confusing the screen, we can use the option inside the skin modifier on the category Display > Show no envelopes.

Note: Once all the objects for the skin are added, we don't need to have the layer Hidden visible we can hide it and focus on the weighting, so we don't see objects that we don't need in the viewport.

We will start adding new objects to the skin modifier. Make sure the layer Alien_Hidden is not hidden. Use the "_Arm_*_SK_*" to add the object for skin. We don't need to edit the skin properly for both arms; we can use the options for mirror weight so once we have one side weight properly we will mirror the other side. For a quick start, I recommend weighting each area 100 that you think will follow a bone; when two bone areas meet another bone, weight 50 to one bone and 50 to the other (**Fig.23**).

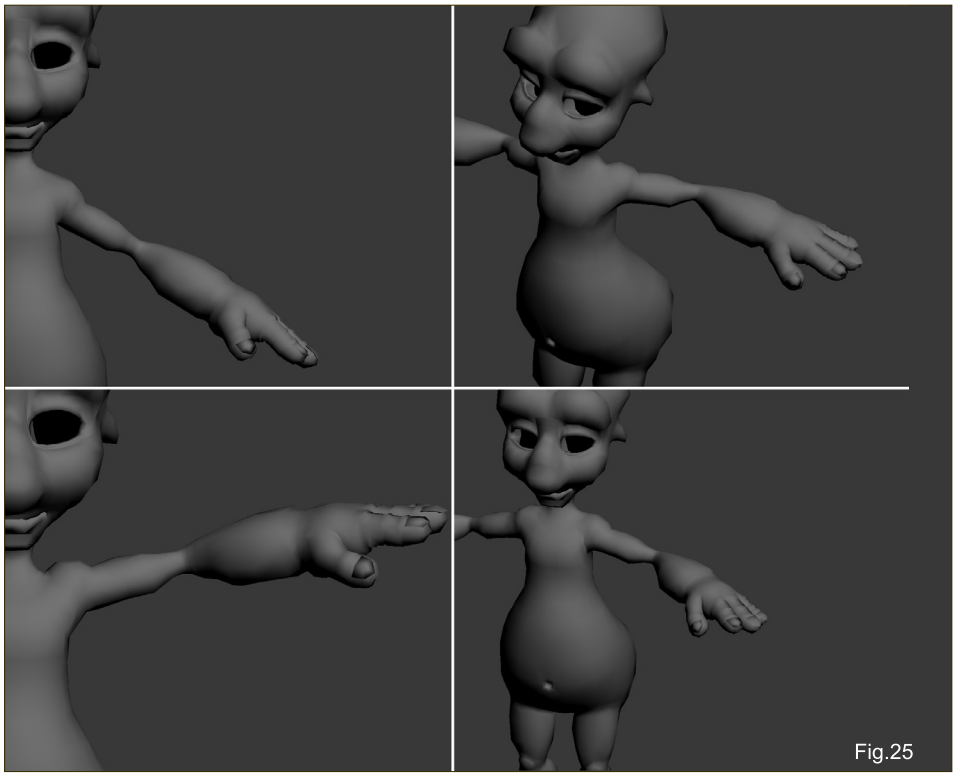

Fig.23


Fig.24

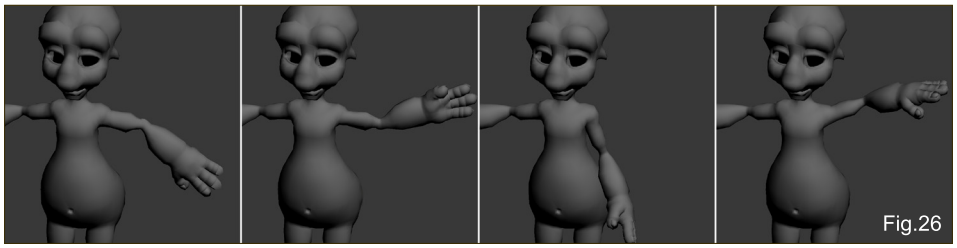
We will skin all the fingers for the hands now and later we will skin them to the finger bones when we build the rig for the fingers (**Fig.24**).

Open Maxfile: 3.4_Alien_Arm_skin_01.max to be at this stage.

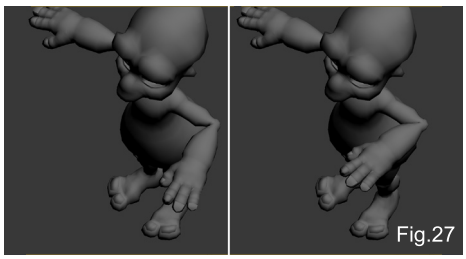
Once you have the base skin, create poses for testing the skin. Use the rig in FK mode as it is easier to pose the desired poses. Create poses for each FK control to see how the skin reacts. Each pose is 10 frames after the previous pose. Test only one control at a time, so we can locate the deformation. I prefer this system as it means we won't forget to skin for any possibility. Having a few controls moved at the same time can make the tweaking of the skin a bit confusing.

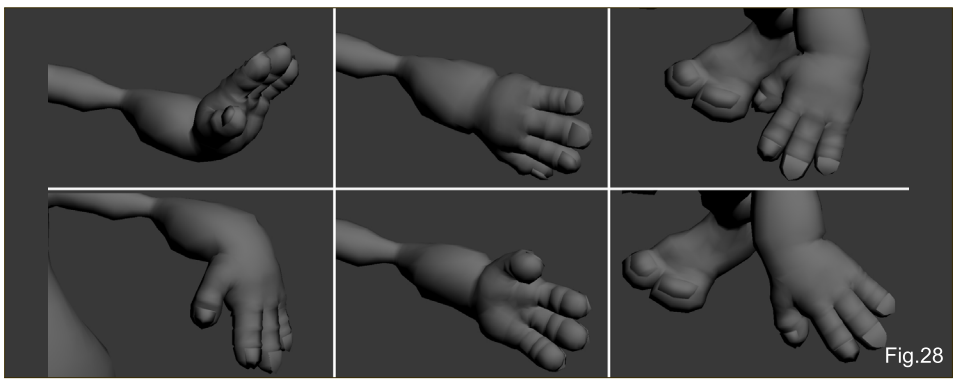

Fig.25

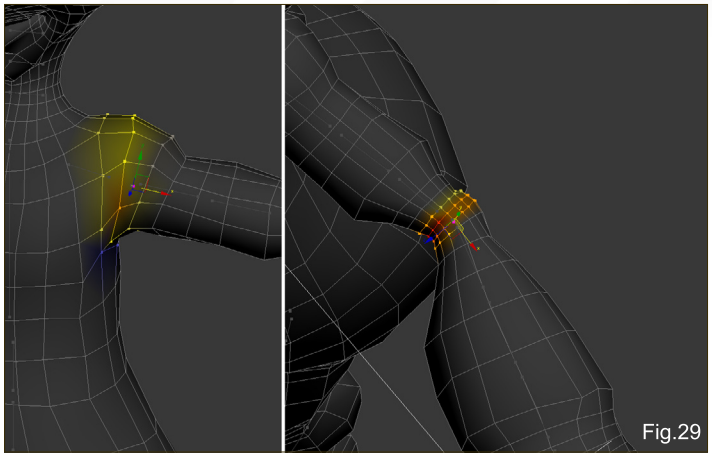
Note: A good practice is to key all the controls in each pose to avoid strange in-between poses. We can do regular procedures, or we can select all the controls at the desired frame and using IMR key tool with the option *KeyAll* put a key in each control object in each controller (**Fig.25 – 28**).

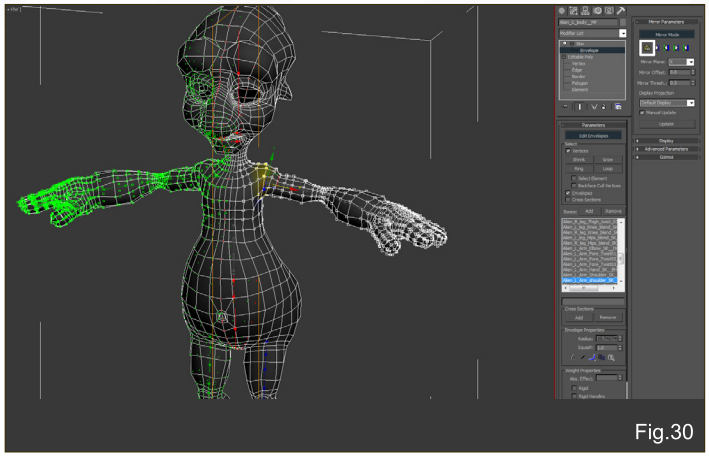

Fig.26

Once you have created all the poses, tweak the skin.


Fig.27


Fig.28


Fig.29


Fig.30

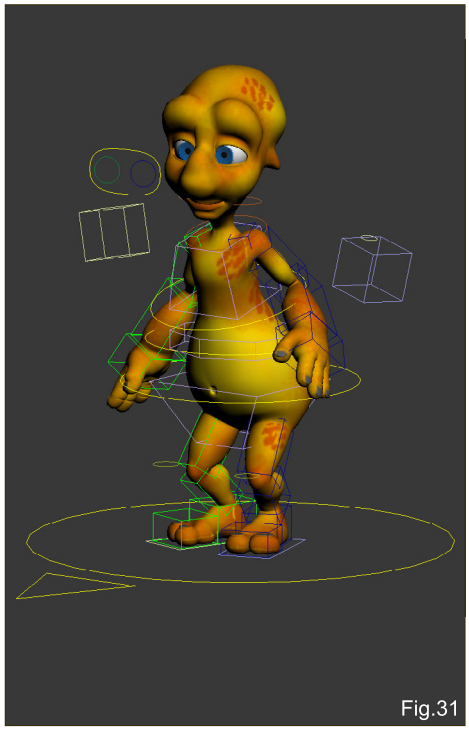
Open Maxfile: 3.4_Alien_Arm_skin_02.max to be at this stage.

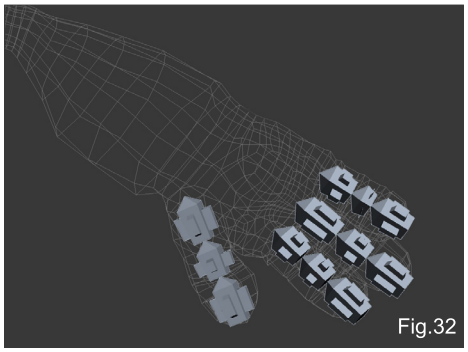
The two blend objects that we created for helping the deformation need special attention - with them we will achieve a much better deformation in the shoulder and elbow area (**Fig.29**).

Now that we are happy with the left arm, unhide the polygons to be able to see the right one. Select all the vertexes for the left arm. In the modifier skin in the mirror option, use the button Mirror Paste to paste a symmetric weight to the other arm. The Symmetry tool will save you lot of time only having to weight one side properly and later paste the symmetry (**Fig.30**).

Open Maxfile: 3.4_Alien_Arm_skin_02.max to be at this stage.

The character is almost ready. Now test a few poses and check that the rig behaves properly (**Fig.31**).


Fig.31


Fig.32

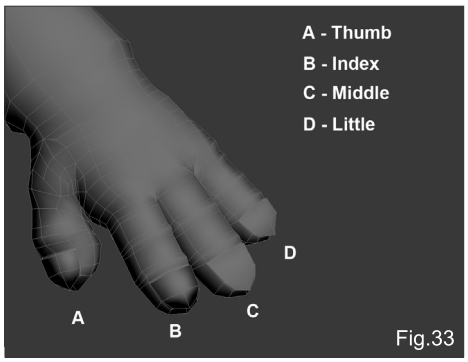
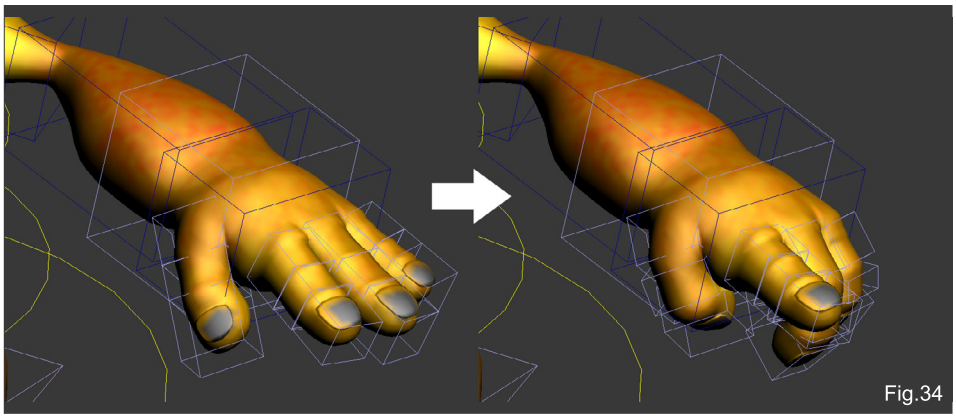


Fig.33

Fingers Animation Rig

Bones

We will use three joints for each finger to imitate the phalanxes we have in the hand. Because it is a cartoony character it doesn't have the five fingers of a normal human. We will use four fingers and name them thumb, index, middle and little (**Fig.32 – 33**).


Fig.34

Controls

We will have three controls for each finger, Thumb, Index, Middle and Little. The controls will be pure FK and we will only rotate them. With this we can achieve the desired poses in the hand (**Fig.34**).

Creation of the Hand Rig

As with the leg and arm we will do the left hand and reproduce the same steps to create the right side.

1) Place the bones in the right place for each finger. Start in front view and later use the Bone tools to move the bones and be sure their pivot is in the right place. Place the joint a bit higher in the profile of the finger because the deformation will work better.

Note: The placement of the bones for the fingers is quite tricky, so pan the views and be sure it is right in all the angles you can check (**Fig.35 - 36**).

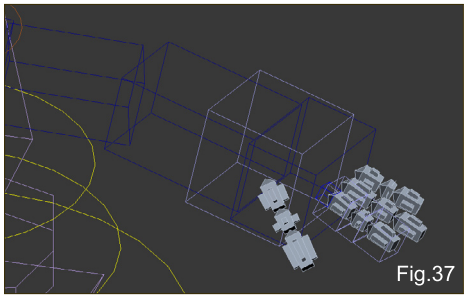
Open Maxfile: 4.3_Alien_fingers_01.max to be at this stage.

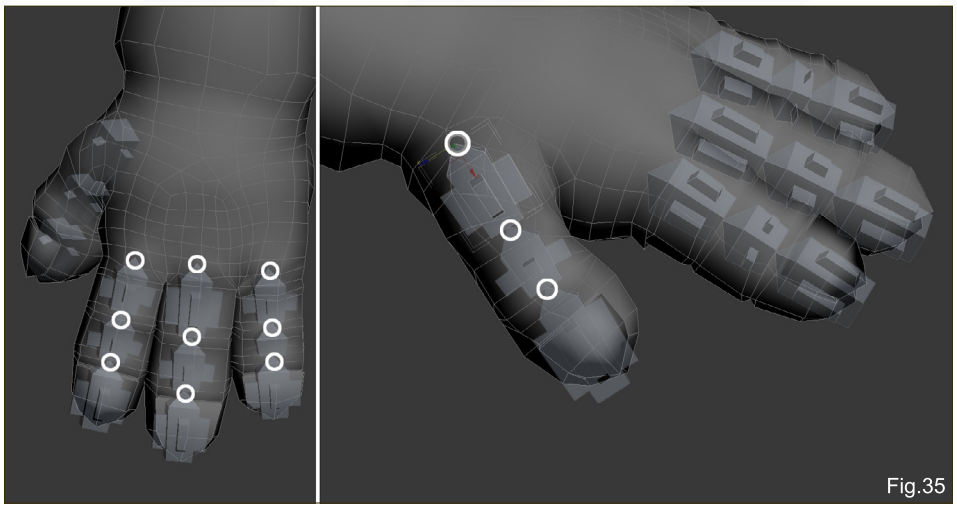
2) Name the thumb bones Alien_Fingers_ Thumb01__BH, Alien_Fingers_Thumb02__BH, Alien_Fingers_Thumb03__BH.
Name the index bones Alien_Fingers_ Index01__BH, Alien_Fingers_Index02__BH, Alien_Fingers_Index03__BH.
Name the middle bones Alien_Fingers_ Middle 01__BH, Alien_Fingers_ Middle 02__BH, Alien_Fingers_ Middle 03__BH.
Name the little bones Alien_Fingers_ Little 01__BH, Alien_Fingers_ Little 02__BH, Alien_ Fingers_ Little 03__BH.

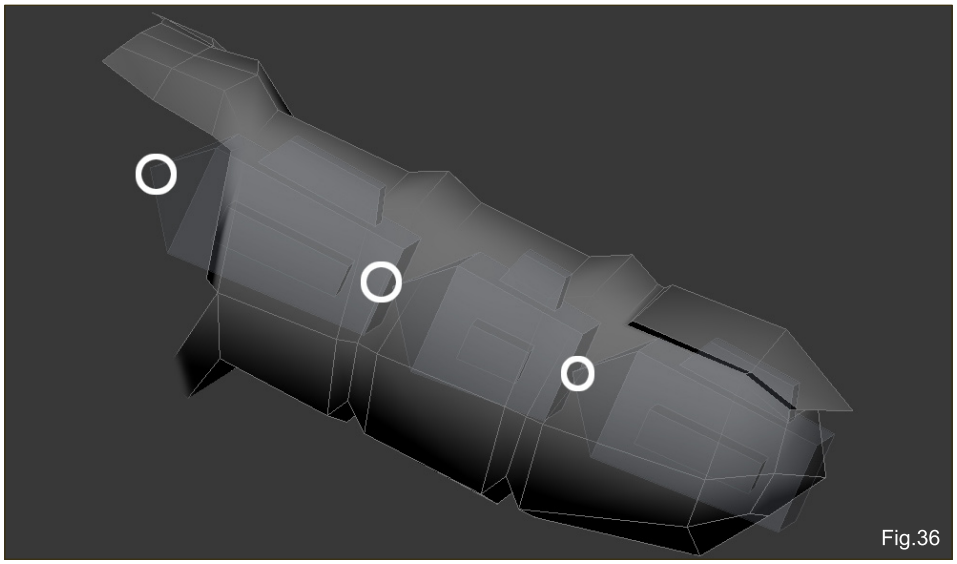
Open Maxfile: 4.3_Alien_fingers_01.max to be at this stage.

Note: In the file I mirrored the bones for the rig hand, so they can be used when the hand is created.

Note: The rig for each finger is the same, so I will explain the index in the following steps and later you can repeat the same steps for the thumb, middle and little finger.


Fig.37


Fig.35


Fig.36

3) Select the Alien_Fingers_Index01__BH, apply an IMR Point Parent and name the point Alien_L_Fingers_Index__DH .

4) Select the objects Alien_Fingers_Index01__ BH, Alien_Fingers_Index02__BH, Alien_ Fingers_Index03__BH and apply an IMR Bone to Box. Resize the boxes until the cover the fingers geometry.

5) Apply an IMR Convert to shape to the three boxes. Name the shapes Alien_Fingers_ Index01__SA, Alien_Fingers_Index02__SA and Alien_Fingers_Index03__SA.

6) Link Alien_Fingers_Index03__SA to Alien_ Fingers_Index02__SA. Next link Alien_Fingers_ Index02__SA to Alien_Fingers_Index01__SA. And finish by linking Alien_Fingers_Index01__ SA to Alien_L_Fingers_Index__DH.

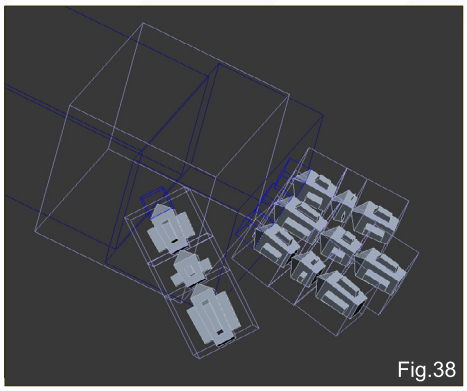
7) Apply an IMR Rotation List to Alien_Fingers_ Index01__SA, Alien_Fingers_Index02__SA, Alien_Fingers_Index03__SA.

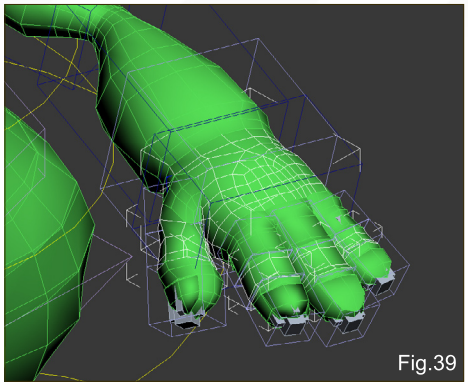
8) Apply a orientation constraint to Alien_ Fingers_Index01__BH with the target being Alien_Fingers_Index01__SA. Then apply a orientation constraint to Alien_Fingers_ Index02__BH with a target of Alien_Fingers_ Index02__SA. And finally apply a orientation constraint to Alien_Fingers_Index03__BH with a target of Alien_Fingers_Index03__SA.

9) Unhide the layer controls. Link Alien_L_ Fingers_Index__DH to Alien_L_Arm_FK_ Hand__SA (**Fig.37**).

Open Maxfile: 4.3_Alien_fingers_02.max to be at this stage.

10) We will repeat the last sets with the other three fingers. As you've probably noticed in the last steps the bones and shapes names are very similar to the bones, so when you do Thumb, Middle and Little use the same names as the index but change the index to the name of the finger (**Fig.38**).


Fig.38


Fig.39

Open Maxfile: 4.3_Alien_fingers_03.max to be at this stage.

11) Now we will unhide the layer proxy, detach the proxy of the hand and the geometry for each finger part, and link it to the controls. The name of the proxy will be equal to the control but changing "__SA" for "__PF". Example: Alien_Fingers_Index01__SA proxy will be Alien_Fingers_Index01__PF (**Fig.39**).

Open Maxfile: 4.3_Alien_fingers_04.max to be at this stage.

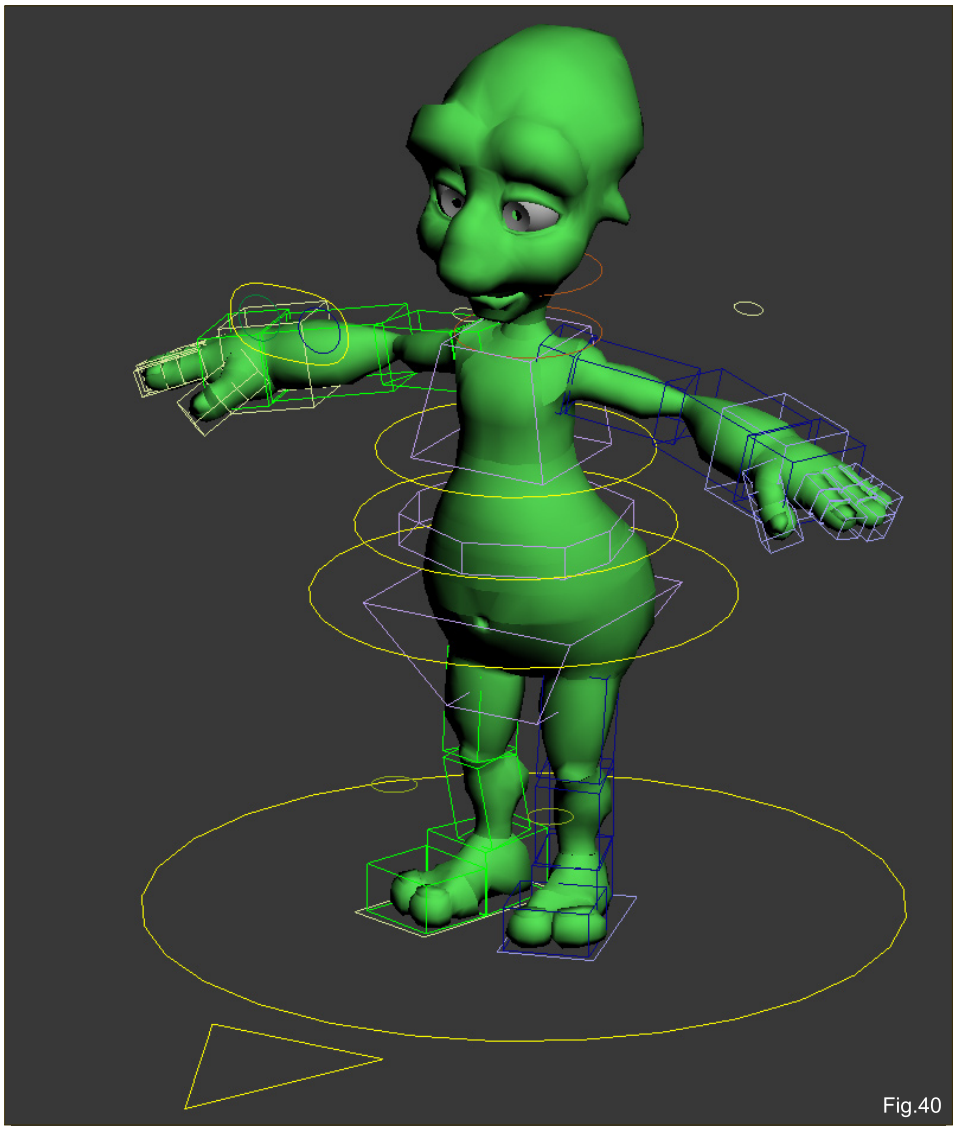
Checklist for Hand Rig

Before we move on to another part of the rig it is good to do a checklist for rigging. There are always too many things to remember to check. Using this checklist will make things easier.

1- Proper names
2- Proper names for the layers
3- Objects in their correct layers
4- No object in layer 0
5- No duplicate names
6- Move the master and check all the meshes follow correctly
7- Controls have correct rotation orders

3- Objects in their correct layers

Remember to use "*_L_Fingers_*__*H" to move objects to the hidden layers, "*_L_Fingers_*__SA" to move objects to the controls layers and "*_L_Fingers_*__PF" to move objects to the proxy layer.


Fig.40

Be sure IMR keytools zero all work properly

Open Maxfile: 4.3_Alien_fingers_05.max to be at this stage.

Create the other side

We have created the left side. You will have to repeat the process for the right hand (**Fig.40**).

Open Maxfile: 4.5_Alien_Fingers_BothSides.max to be at this stage.

Fingers Deformation Rig

We don't need to create extra objects for skinning. We will use the bones we created earlier. We will rename the bones and replace

all the "__BH" bones with "_SK__BH" and then make the wire color red (**Fig.41**).

Skin

Open Maxfile: 5.1_Alien_skinFingers_01.max to be in this stage.

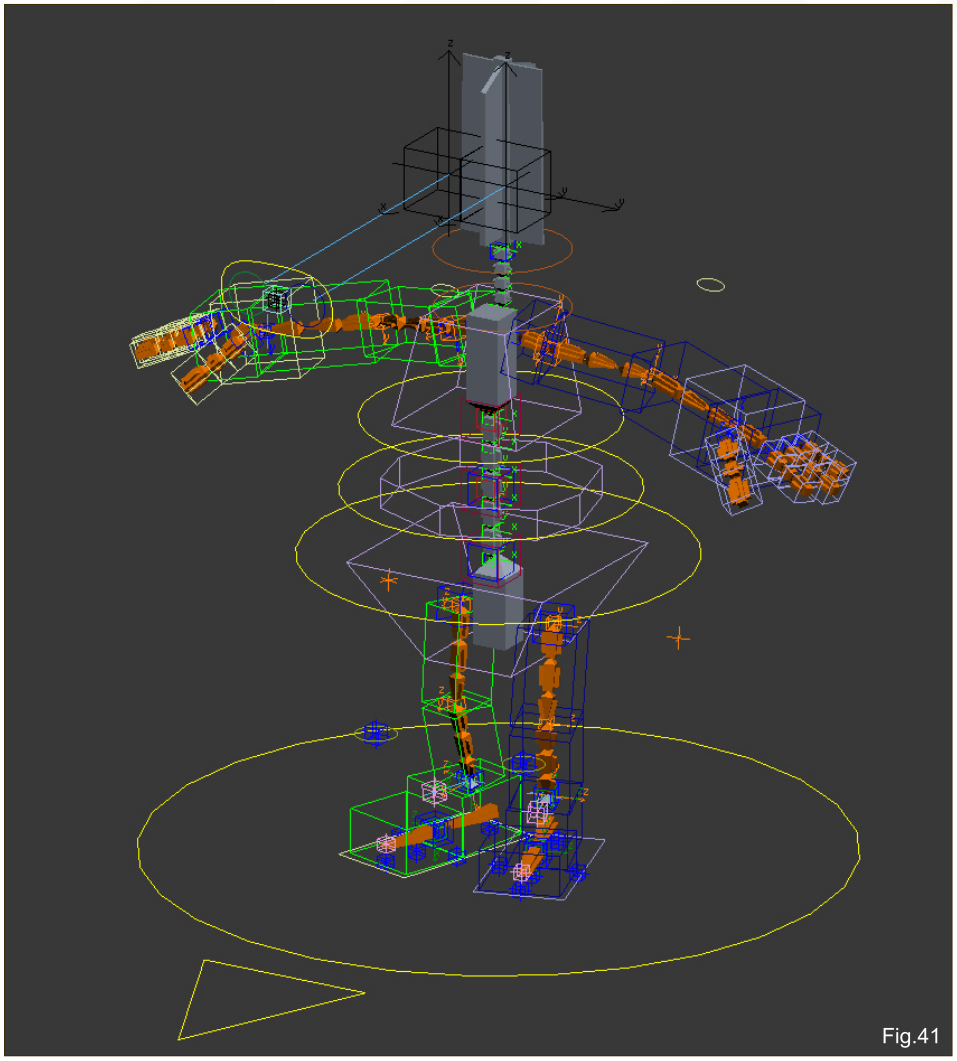
Note: Follow the same notes we use for the arm.

We will start adding new objects to the skin modifier. Make sure the layer Alien_Hidden is not hidden. Use the "_Fingers_*_SK_*" to add the object for skin.

We don't need to edit the skin properly for both hands; we can use the option mirror weight so once we have one side weighted properly we will mirror the other side.

For a quick start, I recommend weighting 100 each area that you think will follow a bone; when two bone areas meet another bone, weight 50 to one bone and 50 to the other (**Fig.42**).

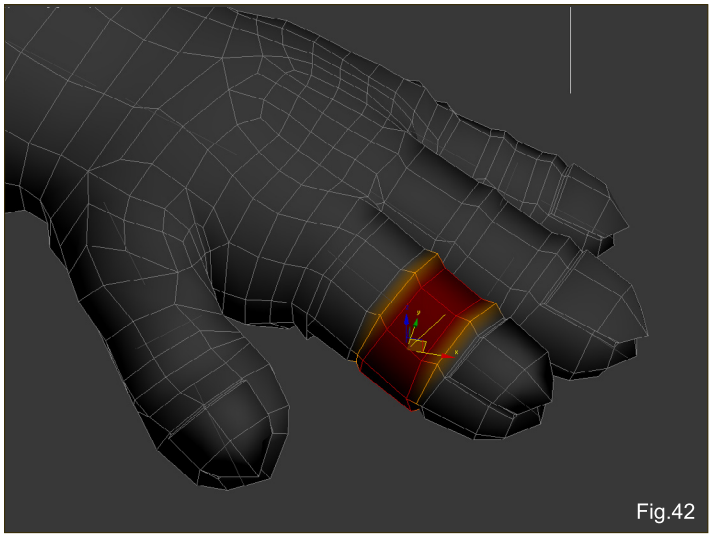
Open Maxfile: 5.1_Alien_skinFingers_02.max to be at this stage.

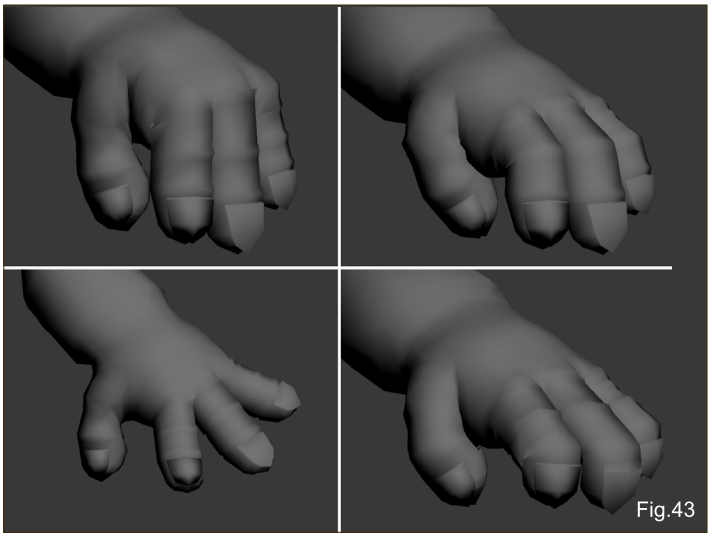

Fig.41

Once you have the base skin, create poses for testing the skin. Create poses for each control to see how the skin reacts. Each pose is 10 frames after the previous pose. Only test one control at a time, so we can locate the deformation. I prefer this system, as we won't forget to skin for any possibility. Having a few controls moving at the same time can make the tweaking of the skin a bit confusing.

Note: A good practice is to key all the controls in each pose to avoid strange in-between poses.

We can do regular procedures or we can select all the controls at the desired frame and using IMR key tool with the option KeyAll to put a key in each control object in each controller. Once we have created all the poses, tweak the skin (**Fig.43**).


Fig.42


Fig.43

Open Maxfile: 5.2_Alien_skinFingers_03.max to be at this stage.

Now that we are happy with the left hand, select all the vertexes for the left arm. In the skin modifier in the mirror option, use the button Mirror Paste to paste a symmetric weight to the other arm. The Symmetric tool will save you lot of time only having to weight one side properly and later paste the symmetry (**Fig.44**).

Open Maxfile: 5.2_Alien_skinFingers_04.max to be at this stage.

Final Tweaks

Now that we have skinned the arms and fingers, we can put back the shaded mode in material colour. Finally add a turbosmooth modifier on top of the skin to see how the mesh will look subdivided.

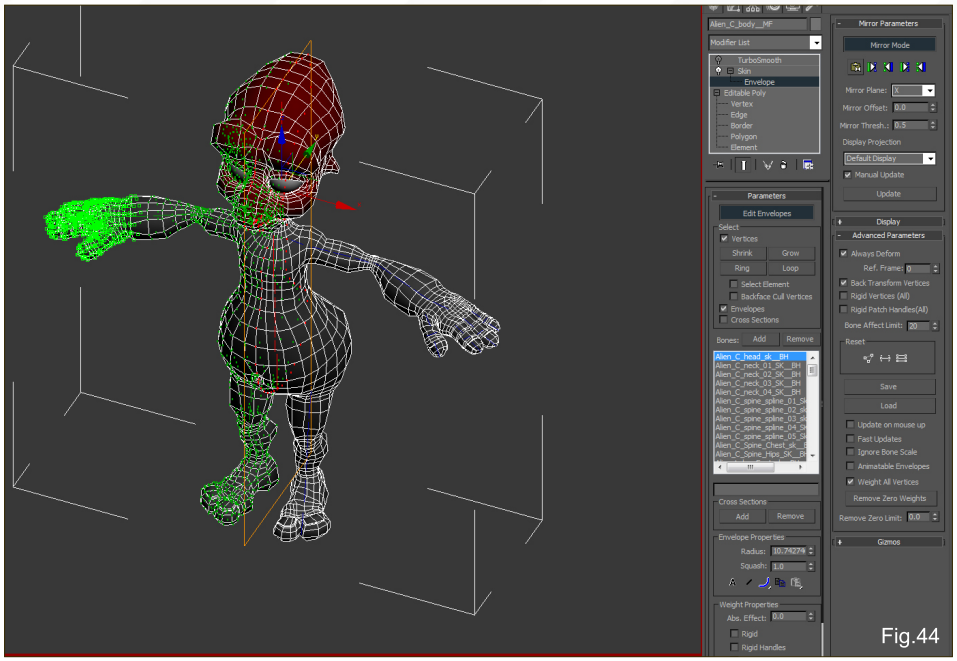
Open Maxfile: 6_Alien_ArmHand_final.max to be at this stage.

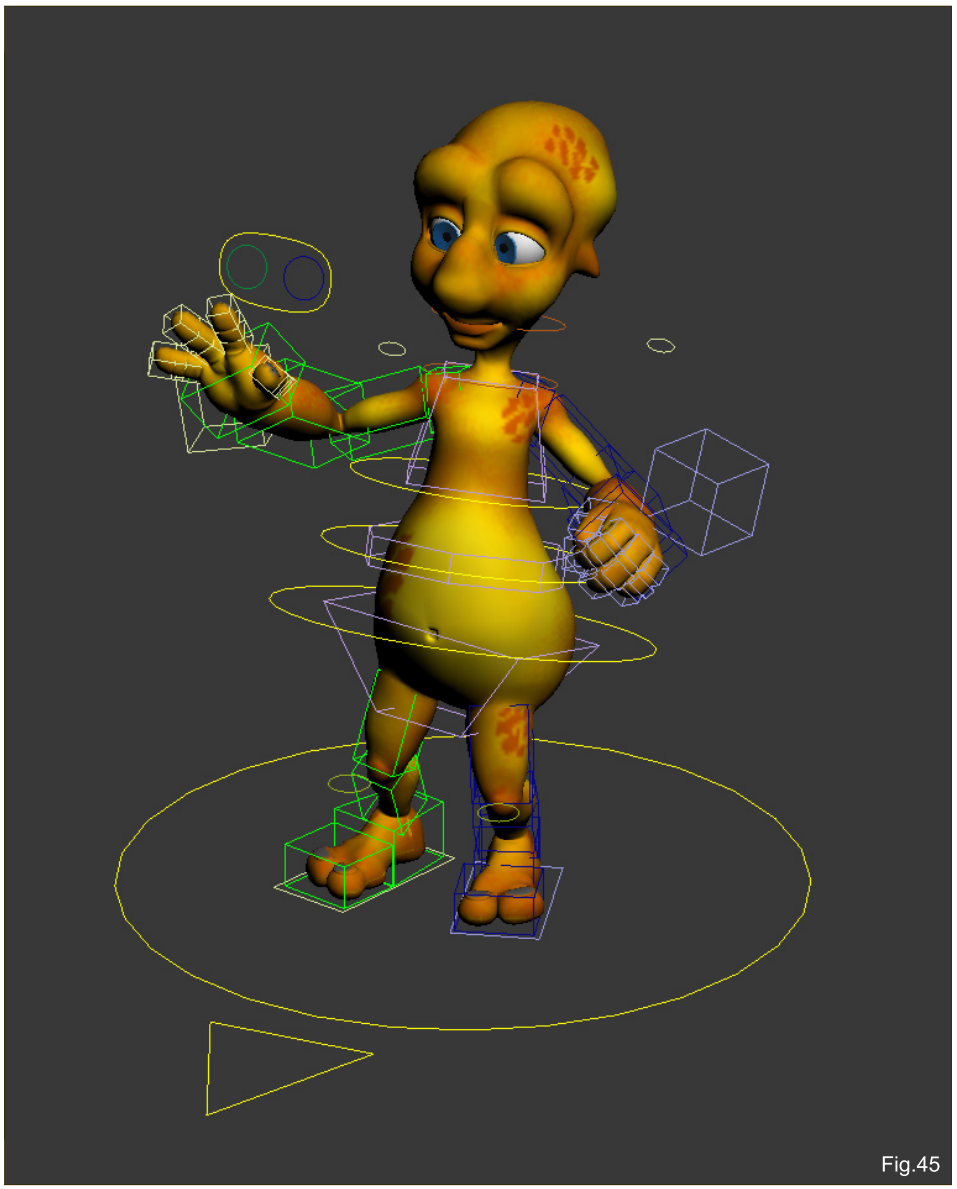
We must leave a clean file to continue in the next chapter. To do so we have to erase the animation of the controls; we can do it with Max normal procedures, or we can select all the controls at frame 0 and using IMR key tool erase the keys with the option Clear All.

Now we have all the body parts of the character rigged we can do some test poses with it (**Fig.45**).

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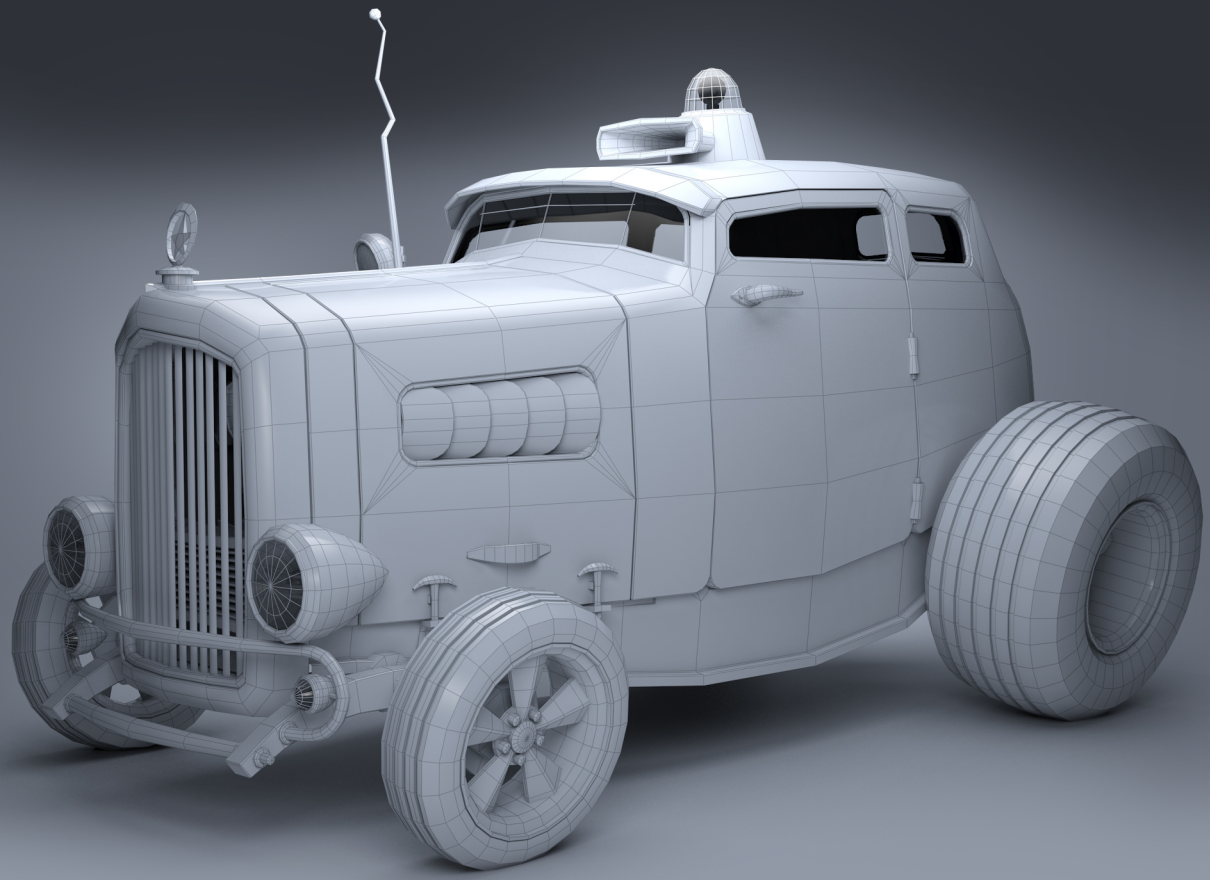

Fig.44


Fig.45

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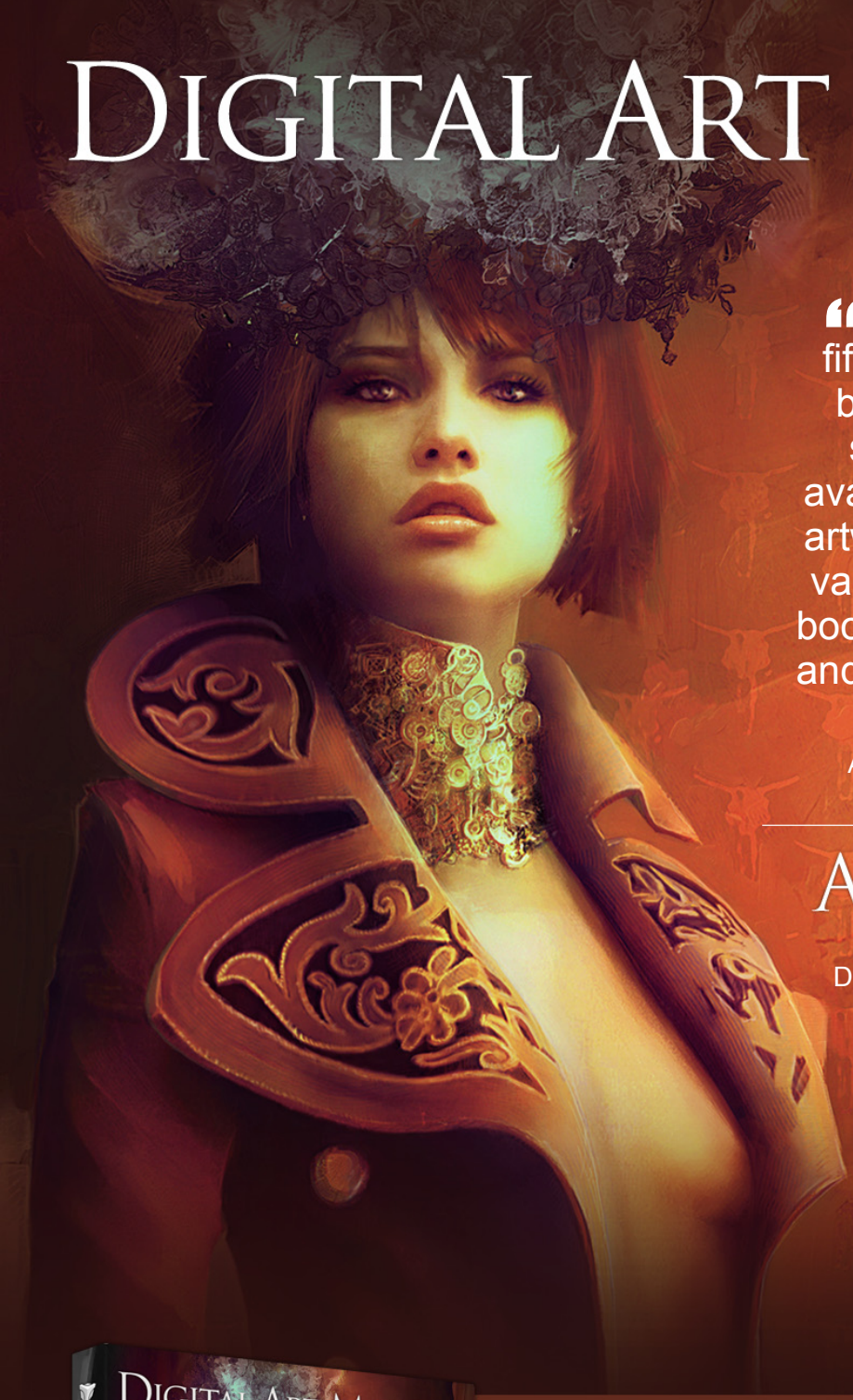
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Following on from the success of our first four books, we received yet another overwhelming response to our call for submissions for Digital Art Masters: Volume 5. Once again over 1,100 submissions made their way into the Digital Art Masters mailbox, proving to us that the series is becoming ever more popular with not only our readers, but artists around the world too!

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Chapter 5 | This Issue
Facial Rigging

Chapter 6 | Next Issue
Scripting



INTRODUCTION TO RIGGING

The aim of these tutorials is to show and explain how you might tackle rigging your 3D character for animation. These tutorials will give help and advice to novices and experts who are looking to build on their rigging skills or approach rigging for the first time. The series gives a detailed step by step guide as to how to approach rigging but also shows us how to tackle common problems and issues that regularly occur even in a professional environment. The artists will be reflecting on working in the industry as well as talking us through their individual approaches to creating the best rigs possible.

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Introduction to Rigging: 5 - Facial Rigging

Software used: Maya

Chapter Overview

In this chapter, we will learn how to build a simple yet powerful facial rig. We will explain how to do facial expressions using blending shapes and get more advanced results using joints for local deformations of the face. It is easy and fun (**Fig.01**).

Blendshape Theory

Sometimes deforming meshes by just painting influences can be tiring and time consuming. Instead we can model the desired deformation and then apply it to our mesh using the blendShape deformer. By duplicating our model and deforming it using any modeling tool, we have the ability to make these deformations show up whenever we want by applying them as blendShape targets.

To create a blendShape deformer, select two meshes that have the same topology (same number and order of points - do this by duplicating the geometry), edit the copy as desired and then select it and the original model (in this order) and go to (Animation > Create Deformers > Blend Shape). You will get a blendShape deformer with an attribute that does the transition from one geometry to another; you decide how much influence to use in the channelBox.

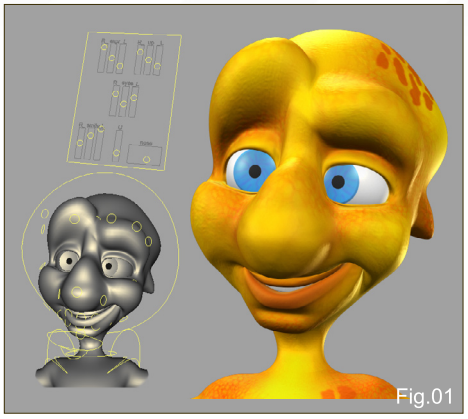
This works pretty much the same as joint skinning. Each point has a starting position (the default mesh) and an end position that is weighted by an envelope multiplier. You can even create exaggerated deformations or input negative values if you need, just take care not to overuse this feature and get ugly deformations.

The blendShape technique is widely used for facial rigging for it's speed and for when it would be difficult to achieve some facial expressions using any other deformer.

TIP (blendShape target editing) = Remember to never freeze the transformations of your copies, otherwise they will offset the overall position of the mesh when deformed.

Facial Blend Shapes

Please try to make your rig as simple as possible as we can get pretty good results for facial animation using only basic blend shapes and combining some of them (hence, the "blending"). To help you build a good blend shape system look at the images in this chapter. There are a lot of ways to modify your original model to create your blend shape targets, so feel free to use the Deformation tools you want because there is not only one way to do this. These are the main targets for a simple facial rigging (**Fig.02**).


Fig.01

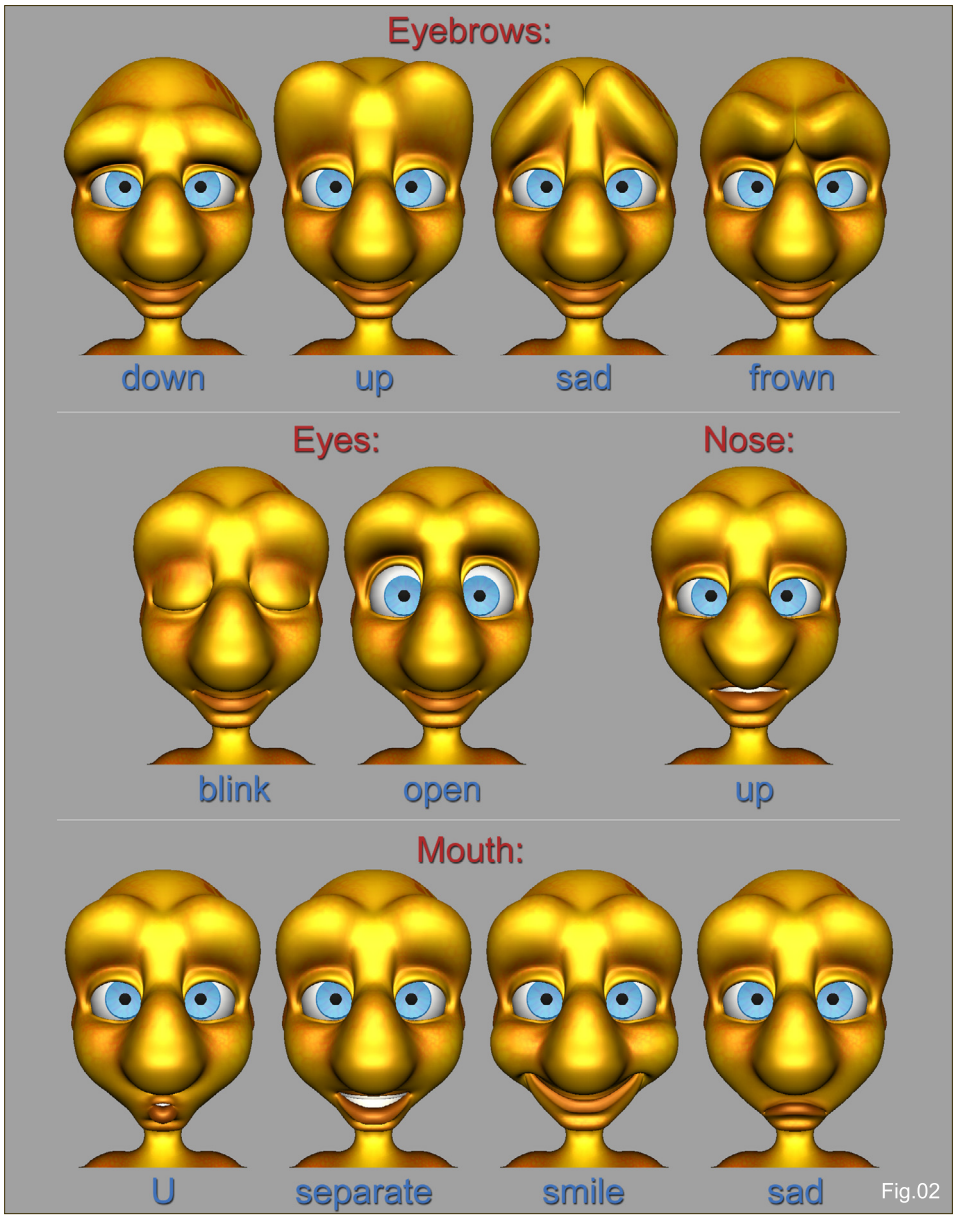
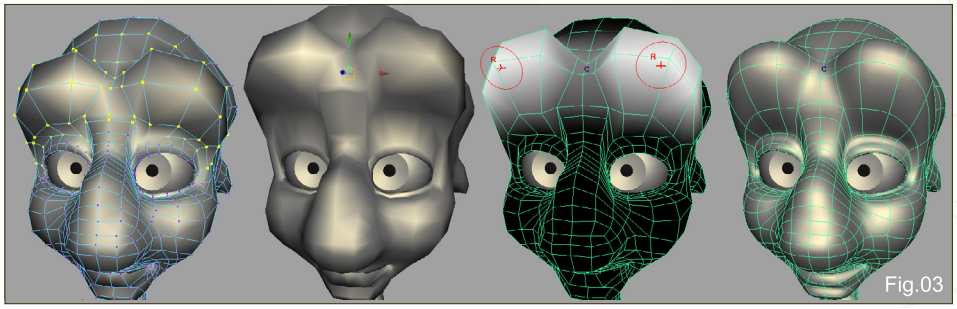


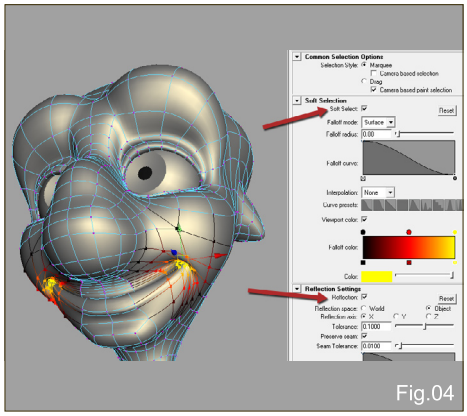
Fig.02

TIP (get blendShapes) = Use deformers like clusters and lattices or simply move, rotate and scale vertices, edges or faces to get the blend shapes. You can also select the model and press the "3" keyboard key to make it smoother and easy to see the final result of your blendShapes. Try it (**Fig.03**).


Fig.03

MODELING THE TARGETS

We usually model the blendShape targets using the Move tool with the Soft Selection and Reflection options turned on to edit vertices. Hold the "B" button and drag on the viewport to change the radius of this manipulator (**Fig.04**).


Fig.04

TIP (model blendShapes) = You can also model the targets using another modeling software other than Maya; just make sure you export and import the mesh correctly without changing its position and point order.

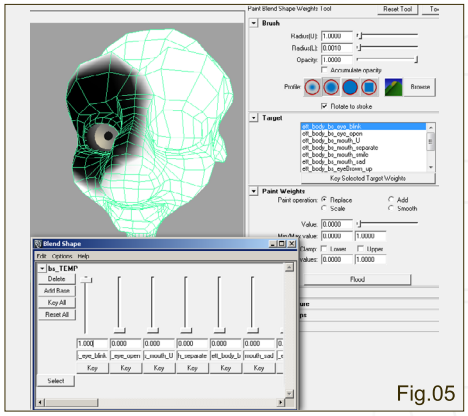
BREAKING THE SYMMETRY

Usually we create perfect symmetrical deformations, and sometimes we need to have them separated by left and right sides to break this symmetric feeling. To do this easily, duplicate the original model and rename it as a temporary copy like "tempToBS". Apply all blend shapes created on this new temporary copy by selecting all of them first and then the "tempToBS" geometry. Finish by creating the blendShape deformer. Look at the Blend Shape Editor (Any Mode > Window > Animation Editors > Blend Shape) to see sliders that you can use to control the intensity of each blend shape respectively.

Now, when you select the "tempToBS" copy and use the Paint Blend Shape Weight tool (Animation > Edit Deformers > Paint Blend Shape Weights tool) you are able to choose what regions of the mesh will receive the deformation from the blend shape. This is what we are going to do to separate the sides:

- Set value 0 for the desired blend shape slider and paint one side off - the side that will not be affected by the deformer.
- Duplicate the "tempToBS" and rename it as "mouth_LSmile", if you painted the right side of the smile target as zero, for example.
- Flood paint the entire mesh as value 1 again and then paint the other side off;
- Duplicate the mesh as "mouth_RSmile";
- Repeat this process for all sliders you may think useful.

Do not forget to delete the "tempToBS" copy after getting all the sided targets (**Fig.05**).


Fig.05

WRAPPING UP

The process of creating blendShapes can be made parallel with the body rigging and then brought together at this point. Our next step is to associate the modeled targets to the rigged model. Let's do this by selecting all blend shape targets and lastly select the rigged model geometry (ett_body_geo) and apply the blendShape deformer using the command (Animation > Create Deformers > Blend Shape), we usually use it with Check Topology turned off and in the Advanced configuration tab of the deformer, use Front of Chain as the Deformation Order.

TIP (inputOrder) = Now, it is really very important to know what sequential order of input deformers are been applied in the character model. Depending on how the order is input we can have problems, so verify this with care. We can change this order by right-clicking and holding the right mouse button over the model and selecting Inputs > All Inputs...

The List of Input Operations window will be opened. To edit that order click and drag the middle mouse button in the name of the deformer and release the button below another node. The Blend Shape node must be below the Skin Cluster node!

Do this process if you forget to turn the Front of Chain on while creating your blendShape deformer (**Fig.06**).

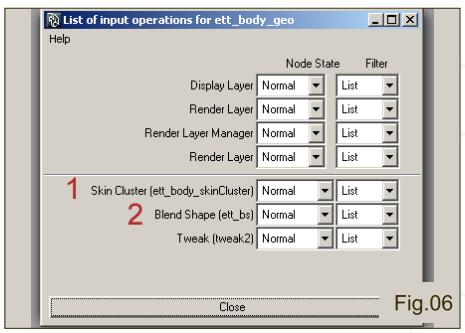


Fig.06

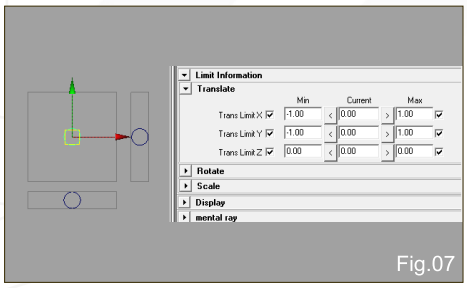


Fig.07

CREATING CONTROLS FOR THE TARGETS

Finally we can create sliders as controls for your blend shapes. These sliders can control single or multiple channels and have horizontal (X) and/or vertical (Y) freedom to be used. Create a nurbs circle (Any Mode > Create > NURBS Primitives > Circle), and in the nurbs' create history modify the Degree attribute to Linear, Section to 4, Normal Y to 0 and Normal Z as 1, then rotate the circle 45 in Z axis and delete the history (Any Mode > Edit > Delete by type > History).

We can now use this circle as a boundary background of our slider. Remember to edit its vertices to obtain a space delimiter for the slider, shape it like a box and turn on the Template option box in Object Display of the nurbsCircleShape node and rename it as "*_sld_bg".

Now create a nurbs circle, rename it as "*_sld_ctrl", limit its translation X and Z to zero and the translate Y to min 0 and max 1. This object will be a vertical and unilateral slider.

If you want to create a square control, limit the translate X to min -1 and max 1. Usually, we position these sliders on the top of the head and group them as a child of the "head_ctrl". In the end, create simple texts (Any Mode > Create > Text) to label this sliders (**Fig.07**).

To connect this slider to the blend shape, you can use setDrivenKeys (Animation > Animate > Set Driven Key > Set…) or maybe direct connecting attributes (Any Mode > Window > General Editors > Connection Editor) (**Fig.08**).

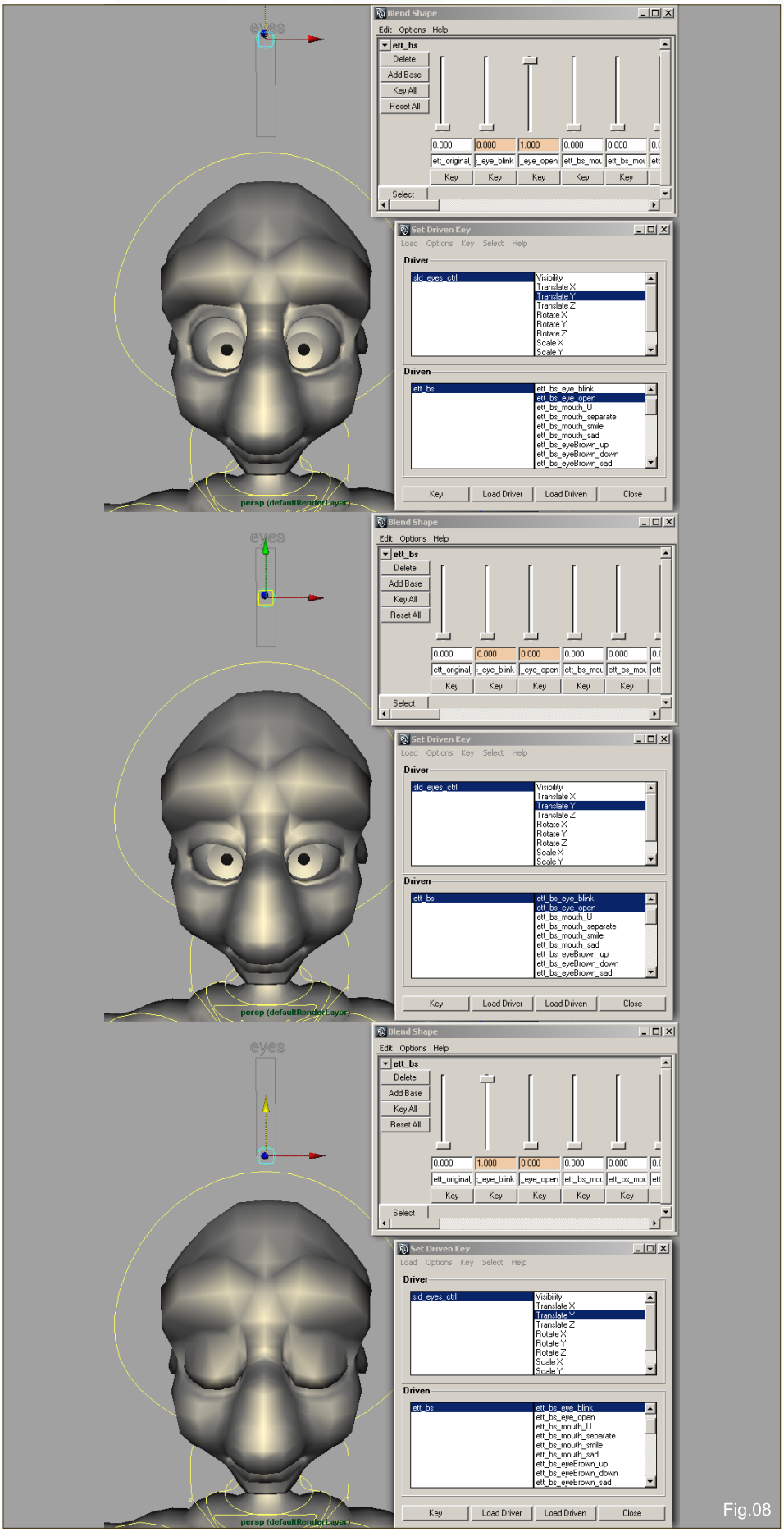
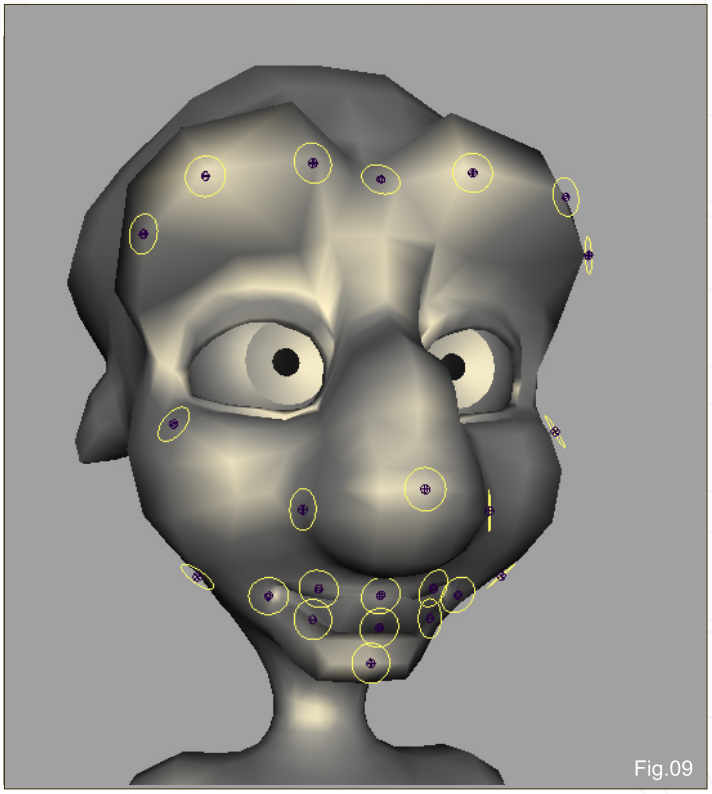


Fig.08

Facial Joints

If you need more control over a specific facial area of your character you can create joints to do this. Start by creating a single joint at the origin of the scene (Animation > Skeleton > Joint Tool); you can do this by holding the “X” key to snap on the grid, clicking at the center and pressing Enter. Create a nurbs curve to be the control of this joint and scaleConstraint and parentConstraint the joint to it. Group the control and move it to the desired position on the face snapping to points holding the “V” key of the keyboard. Repeat these steps for additional joints and do not forget to name them properly (**Fig.09**).


Fig.09

To make the controls follow the head let’s group these control groups and parentConstraint them to the head joint, jaw joint or another part to the facial rig. Remember to put this group under “controls_grp” to keep our scene clean and organized. Do the same to the joints we just created, group them and parent under “joints_grp”.

Now, to deform the face with these new joints we need to add them as an influence of the skinned geometry mesh. So, select all the facial joints and the character model (face) and add the influences (Animation > Skin > Edit Smooth Skin > Add Influence).

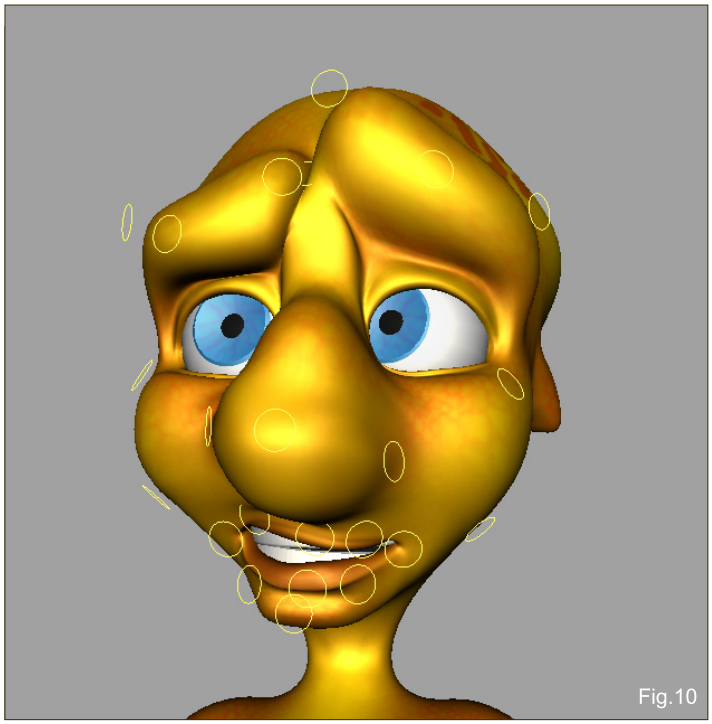
You can now paint the skin influences of the facial joints using (Animation > Skin > Edit Smooth Skin > Paint Skin Weights tool) and getting the values from the head and jaw joints (**Fig.10**).

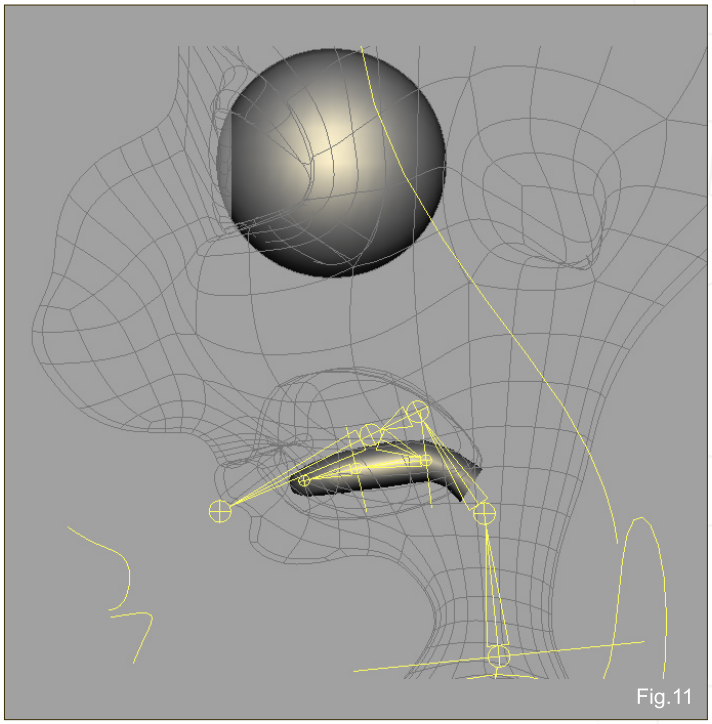
Tongue

You can rig a simple tongue by creating three joints and parenting them on the chin joint. Skin these joints to the tongue geometry and create nurbs curves shapes parented to the “chin_ctrl” to control these joints. It is really simple (**Fig.11**).

Teeth

The rigging of teeth is just geometries in groups that will receive parentConstraints by curves following the “head_ctrl” (for the upTooth) and to the “chin_ctrl” (for lowTooth).


Fig.10


Fig.11

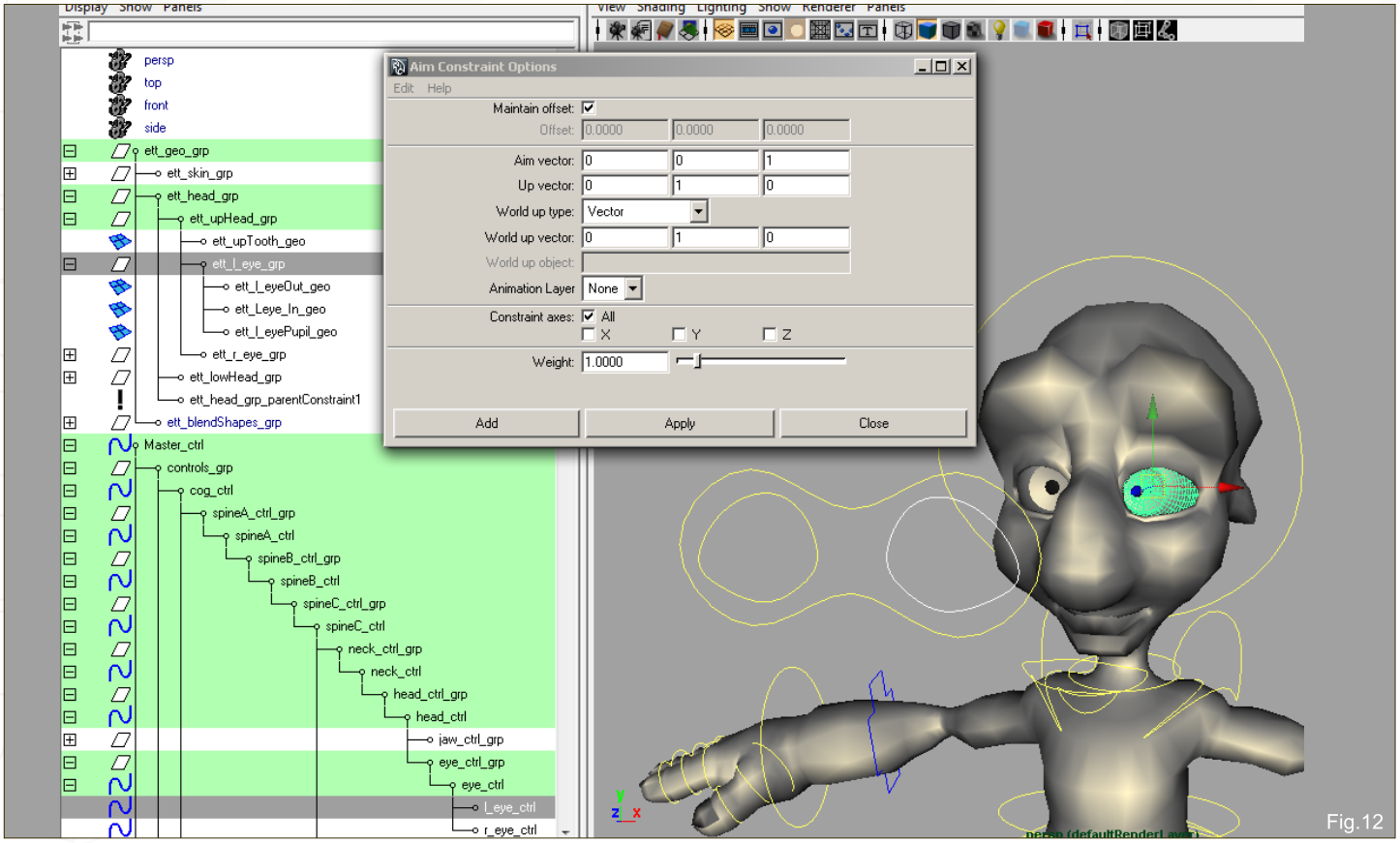


Fig.12

Eyes

Animators prefer eyes that aim towards a "look at" control for characters. So what we do is create two circles, one in front of each eye, and create another one as a father of these so we can move the two eyes together. After that, we just create aimConstraints selecting the eye controls and lastly the eye geometry group and choosing the command (Animation Mode >> Constrain > Aim).

Finally, the last thing to do is to group the "eye_ctrl" named as "eye_ctrl_grp" and parent it to the "head_ctrl". Please remember the eye geometries must be in a group that is parentContrained and scaleConstrained to the "head_ctrl" (**Fig.12**).

Wrapping Up

We have come to the end of our rig. Everything is working nicely and now we just have to hide some things from the animators to avoid them moving and keyframing what they are not supposed to.

Let's create two layers to further organize things:

- One for the character's geometry called "ett_L_geo" - you can put this layer in reference mode so the animators do not accidentally select the mesh;
- And another one for the character controls called "ett_L_ctrl" - you can put the entire "controls_grp" in this layer.

If you followed our organization correctly, just hide the "joints_grp" to make all the joints unreachable. It is simple as that.

Conclusion

All right! We pretty much reached the end of the rigging part of our series as the next chapter will only cover scripting, so make sure to leave nothing behind!

Remember to always keep things simple and organized. Build up your understanding of the basics and try to come up with more complex solutions little by little. If you get mixed up, go back to where you still understand what you are doing and continue. This is the key to learning while having fun and without frustrations.

We hope you liked these lessons and got motivated to study even more! See you in the next chapter, where we will take a look into scripting - something every hardcore rigger should know to help speed and efficiency in any kind of production.

Richard Kazuo & Danilo Pinheiro

For more from these artists visit:

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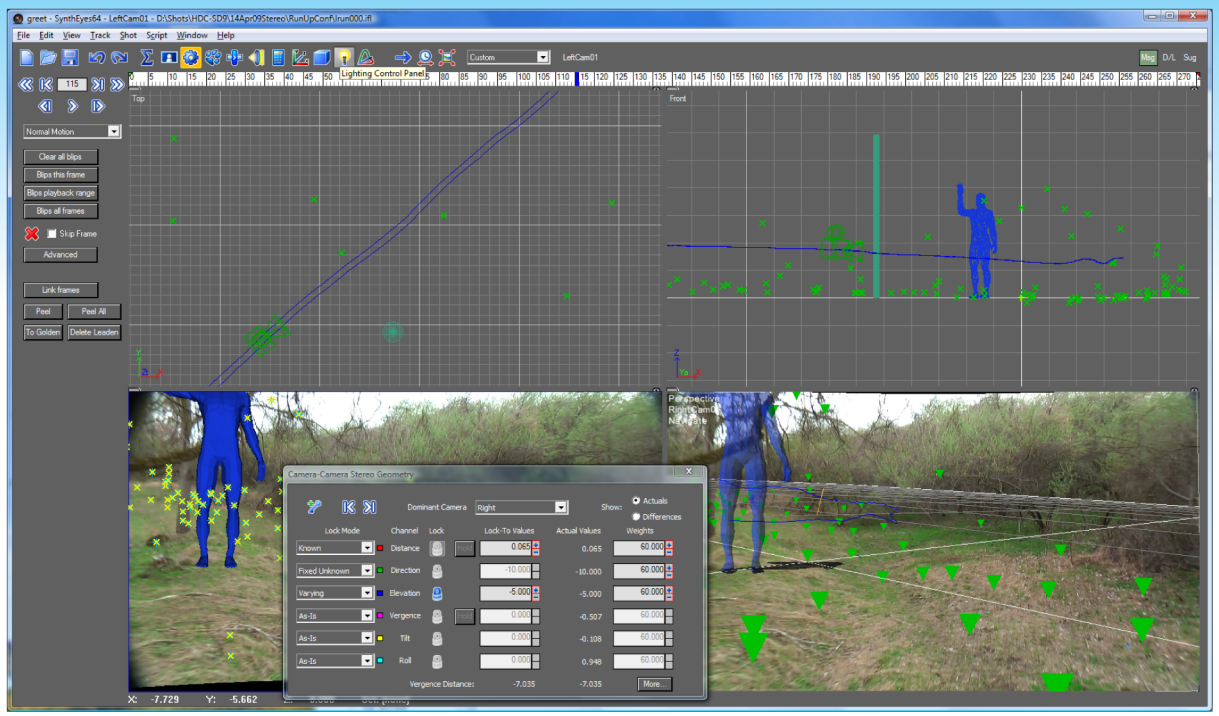
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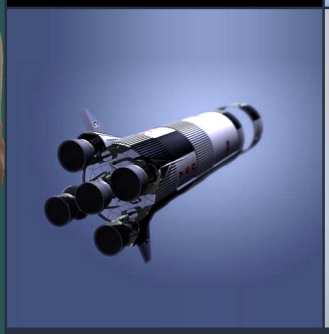
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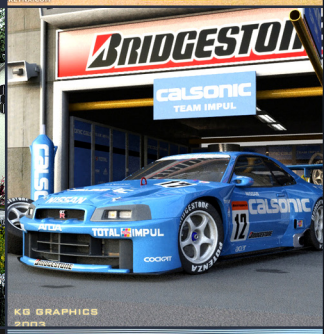



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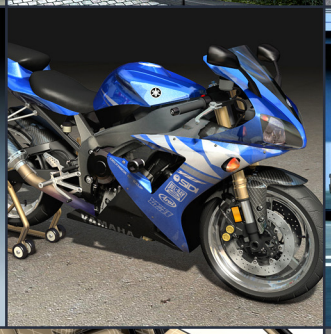
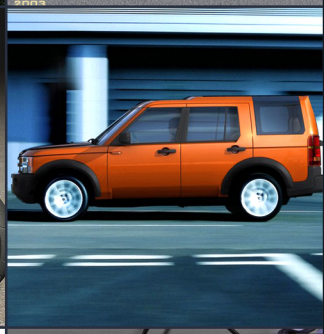
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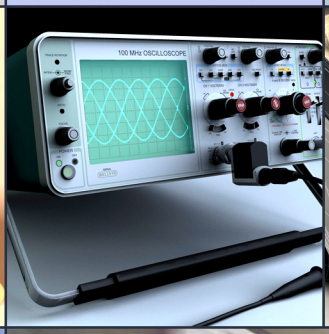




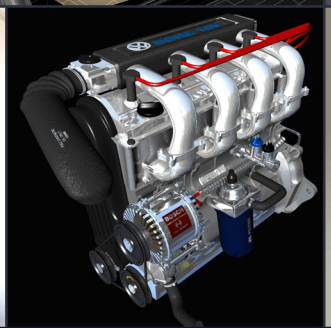












"I tried to make every single element of each character different to the same element in the other character."

Jason Baldwin and Joe Beckley come together to tell us how they made this great gallery image Max and Milton in this month's Making Of. Jason talks us through the modeling process and Joe explains how he textured and rendered the image using Photoshop.

Max and Milton



MAX AND MILTON

Software used: 3ds Max

I was asked to design two characters inspired by the old Goofus and Gallant comics from *Highlights* magazine. One character should ooze attitude and pre-teen rebellion, the other should be an unabashed teacher's pet, but both should feel modern. I decided that I would take an aggressively graphic approach to the design, so I referenced character work from Jamie Hewlett and the movies *Coraline* and *Open Season*. I wanted to push the idea that they were opposites, so I tried to make every single element of each character different to the same element in the other character. I did a few drawings with my remedial skills to work out the designs. Here are a few designs of Milton (**Fig.01**).

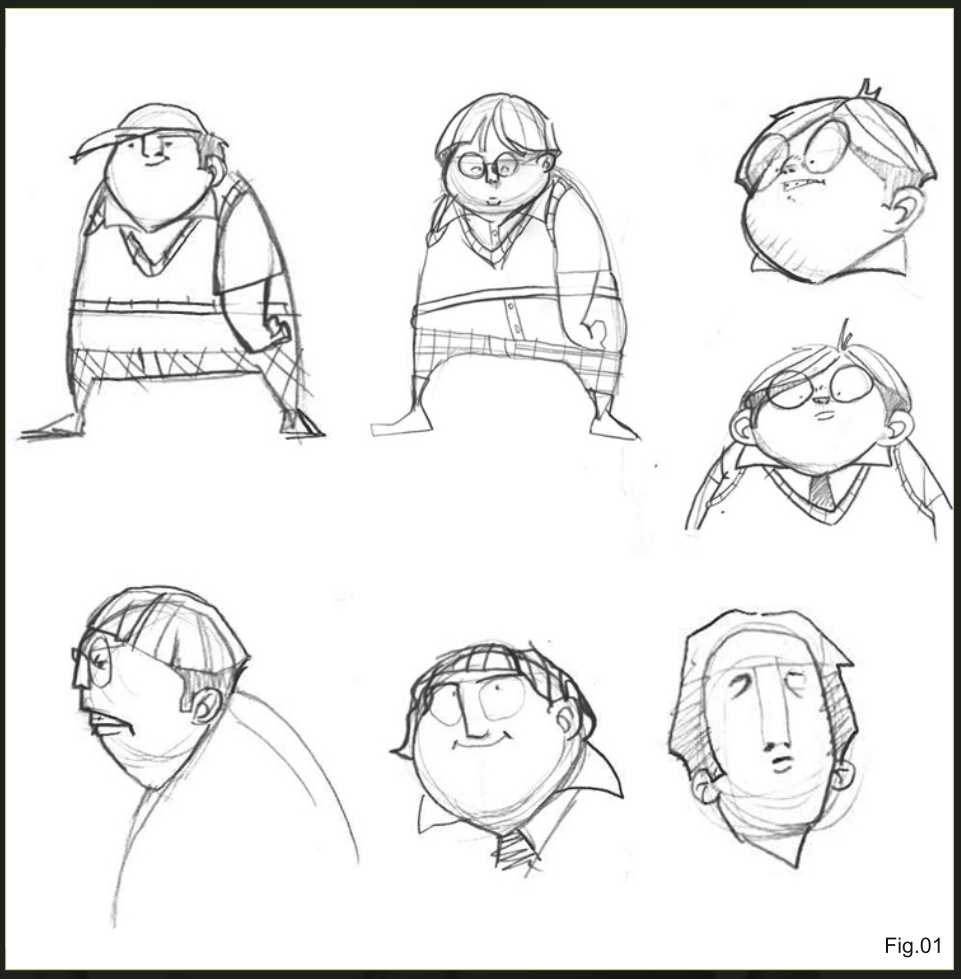


Fig.01

Max's design was based on a lollipop shape. He is skinny, has a wide face, small torso with a high crotch and thin arms with large hands and feet. He's supposed to have an "I don't care" style that he probably takes hours to co-ordinate every morning.

Milton's design was based on a triangle. He's chunky and even though his head may be wide, his facial features are small. His torso is large with a low crotch, and his arms are chunky with proportionally smaller hands and feet. His design is supposed to hint that his mom may still buy his clothes and decide on his haircuts, but he throws on whatever clothes are wadded up on the floor beside his bed.

I modeled both characters with standard extrusions and edge cuts. My first modeling pass was of solid "naked" models. From there I duplicated and scaled out the relevant polygons and modeled those into clothing (**Fig.02**).

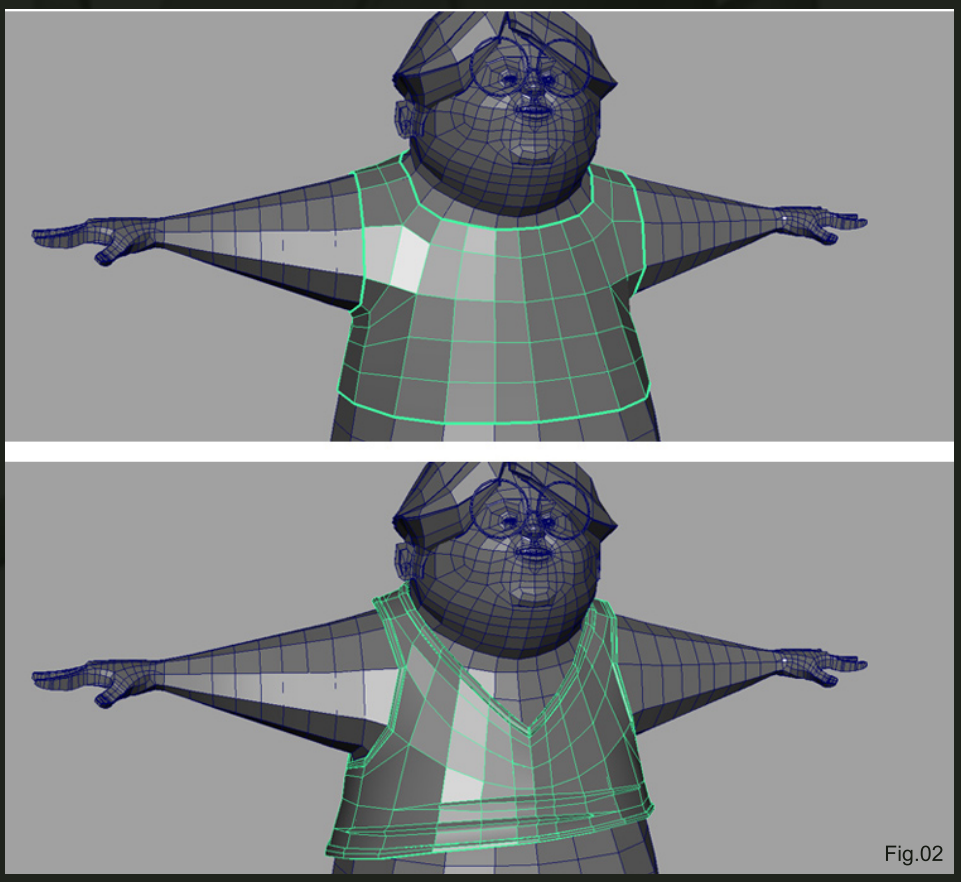


Fig.02

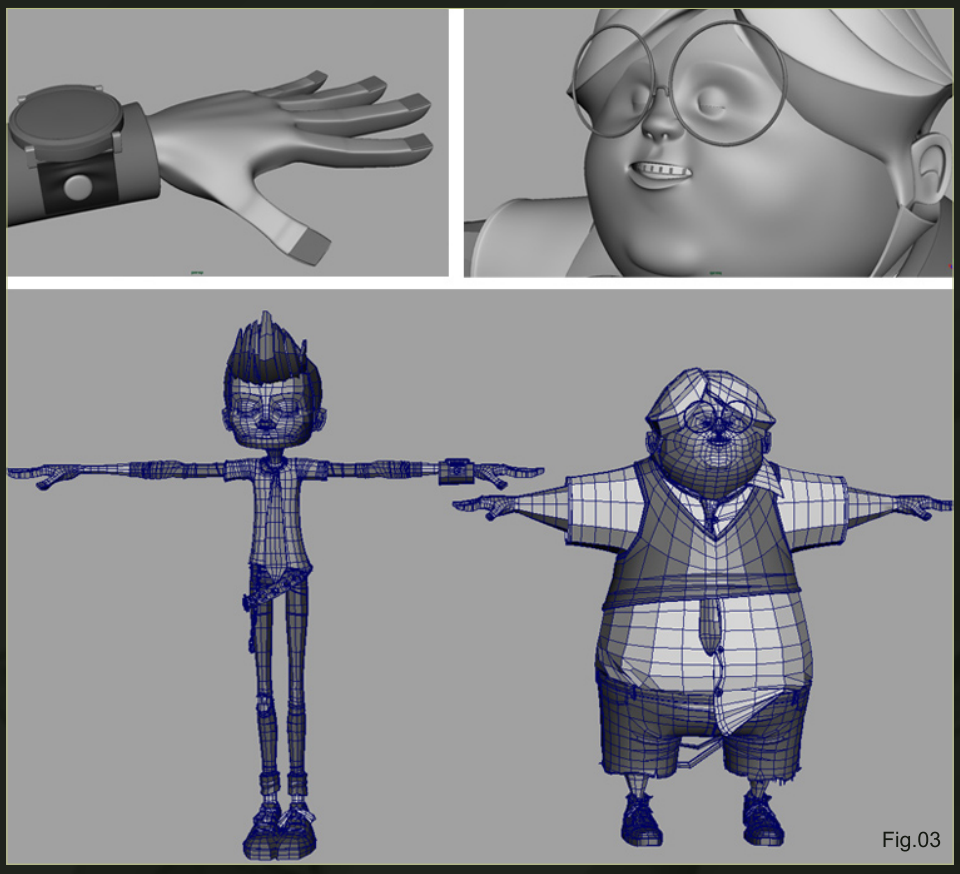


Fig.03

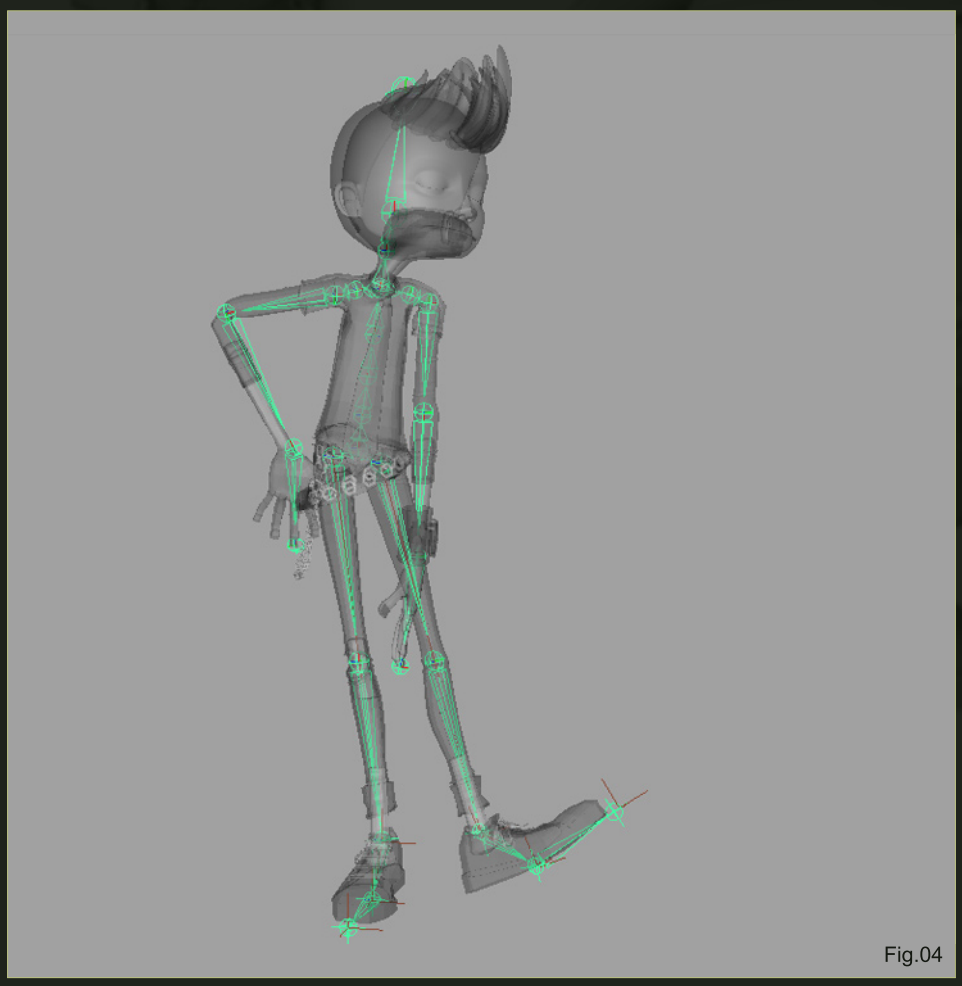


Fig.04

I was careful to pay special attention to creating clean graphic lines on their faces and their silhouettes. I created hard corners on their fingers, lips, brow and bridge of the nose. I let the clothes be more naturalistic, but tried to keep some of the wrinkles graphic. I also tried to make everything a bit asymmetrical (**Fig.03**).

To pose them, I built simple IK rigs and bound them with default smooth skin values. I rigid-bound any belts or chains since I'd rather tackle those deformations by hand. When creating a static pose I find a simple IK rig to be the best route because it is extremely difficult to maintain proper proportions and ground contact with deformers alone. Once the characters are posed I fix deformations by skinning or by manual adjustments (**Fig.04**).

I wanted their poses to complement each other and demonstrate their personality. Both of their poses create a similar line of action, bowing to the screen left and back, but since they're facing different directions the result is different. Max is leaning away from the screen's right point of interest while Milton is shyly looking up and over his shoulder. Max's hips are pushed back, causing him to slouch in a closed pose while Milton's hips push forward and open his pose up. Once I was happy with the poses I added simple grayscale shaders to the models (**Fig.05**). I then created a render with a three-point light setup and an occlusion render, and handed them off to Joe to do his post work. Up till this point we'd been playing around with the idea of Max having long hair. We ended up going with spiky hair and Joe changed that in post production.

JASON BALDWIN
For more from this artist visit:
www.bunkart.net
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jasonsbaldwin@gmail.com

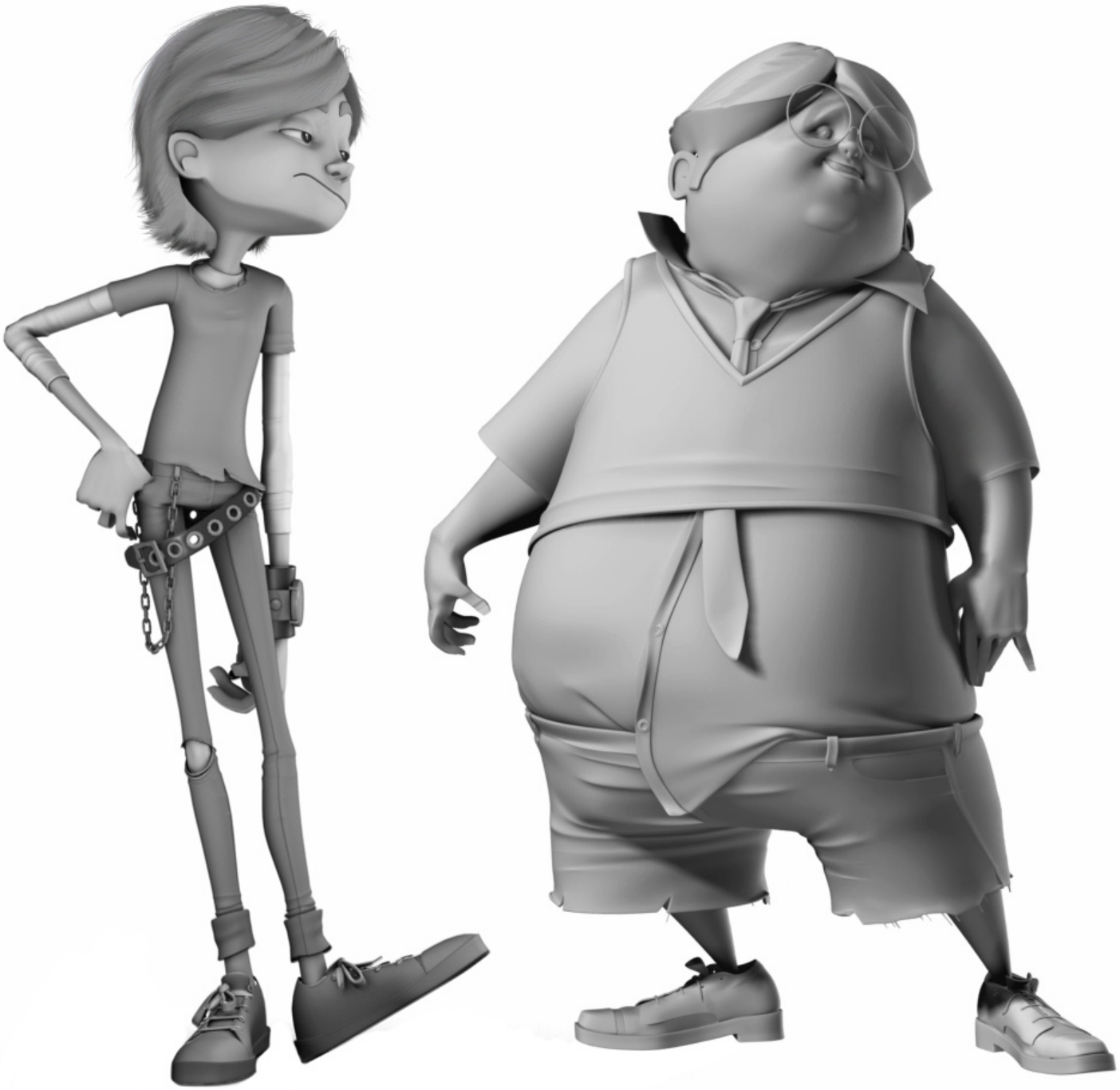


Fig.05



MAX AND MILTON

Software used: Photoshop

Since this was being used as more of a concept piece I painted it all in Photoshop. Elements like color scheme, fabric scale, amount of sub surface scattering, and overall shader quality are much easier to block out and adjust in this phase. For simplicity I'm going to focus on Milton (**Fig.01**).

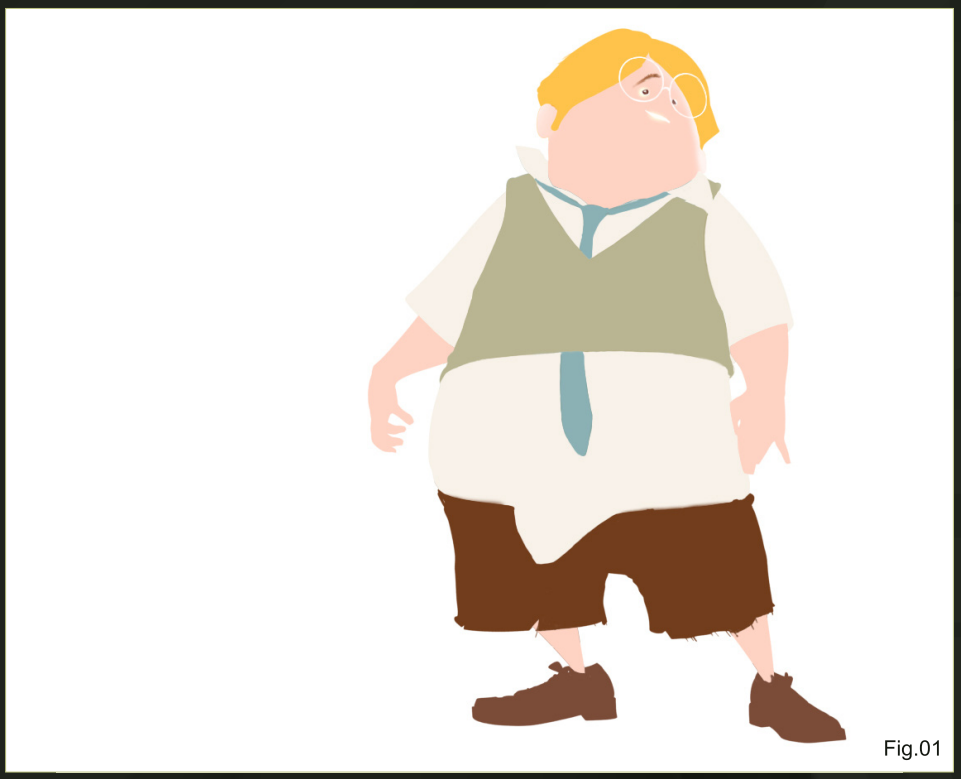


Fig.01

Based on Jason's three-point light render, I created vector masks for each separate item, like the clothing, skin, hair, etc. The reason I used vector shapes here is because of the flexibility of being able to adjust the shape if I need to later down the line (**Fig.02**).

Once the masks were created for each object, I used them to block out my color scheme. At this stage of the process, it's just used to block out the image for overall unity. Rather than trying to adjust a skin tone to something that's white, it's nice to have a surrounding local color to work with, although they'll change depending on surface type. I started using the layer-blending mode as Multiply (**Fig.03**).

My next step was to go back into each layer and start to apply layer effects. This is a very quick and easy way to get shape and surface quality in quickly. Taking the skin for example: by changing the adjustment layer to Overlay and adding an orange/red tinted inner glow layer style set to Linear Dodge at about 20% Opacity and 15px size you get a great sub surface look.

Once the layer effects were in, I went back and added finer detail and blemishes, freckles etc. For other areas with more specific texture definition (i.e. shirt, pants, tie etc) I created a specific base material and warped and painted



Fig.02



Fig.03


Fig.04

the texture. I then created a vector clipping mask for the original mask shape. After the basic material was in place then dirt, scratches, rips and wear were added as a vector clipping mask-blended layer

After the basic shading and texturing was complete, I went back in and adjusted specific tones and did broader adjustments (**Fig.04**). Again, using the skin as an example, I added a warm pinkish/red tone on the cheeks and ears, and a cooler bluish/purple tone on the forehead and other shadowed surfaces to give it a more grounded feeling. Since Jason had provided me with an Occlusion pass, I applied it to the top of my file as a Multiply layer. To avoid the occlusion muddying up the image, I added a Gradient Map adjustment layer to it. This allowed me to do a subtle color bleed effect.

At this stage, the image was pretty close to final (**Fig.05**). The only thing left to do was to integrate the characters into the background, and add any last high res fine detail like stray fabric strands, eye glints, subtle environment bounce etc (**Fig.06**)


Fig.05



Fig.06

Joe Beckley

For more from this artist visit:
www.joebeckley.com
Or contact them at:
mail@joebeckley.com

Modeling by: Jason Baldwin
Texturing by: Joe Beckley

Digital Art Masters Volume 4



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This is more than just an artwork book. Not only does it feature full-colour, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

"Open Green"

by Andrius Balciunas



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The following shots of the “Open Green” book pages are featured here in full-resolution and can be read by zooming in...



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Open Green

By Andrius Balciunas

Software Used: 3d Studio Max, ZBrush, Mental Ray and Photoshop



Introduction

It all started when I saw a simple photograph of a leaf lying on a hand. Because of the professional lighting of the image, or perhaps it was just my mood at the time, it just seemed so beautiful and pleasant. The green color of the leaf and the color of the skin suited each other so well, and it was this that really boosted my inspiration and motivated me to develop my own image. I wanted to create something glamorous yet also gentle, something easy to behold.



Fig.01

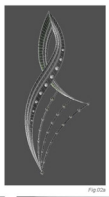


Fig.02a



Fig.02b

Concept

I started the project using just two colors only, which I found to be an interesting approach. I simply began by painting with some simple soft brushstrokes, picking shades of cool greens and warm browns to develop the mood I wanted for the image (**Fig.01**). When I achieved something which resembled the mood I was looking for, I was sure that the final result was going to be satisfying as long as I kept the mood unchanged.

I already knew at the time that I wanted to create a girl dressed in green, and when I started to think about accessorizing her outfit with lots of chains and jewels

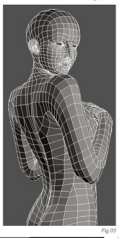


Fig.03



Fig.04

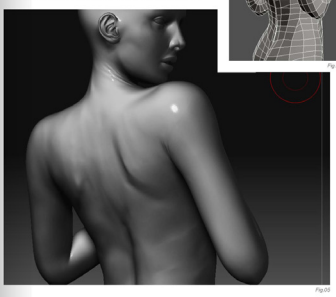


Fig.05

(**Fig.02a – b**), I came up with the idea of making a large glass ball as a pendant dangling down her back. It was at this very point that the title of the image came to me rather naturally: *Open Green*.

Modeling

I started collecting references of various girls on the internet, and found one photo in particular of the fashion model, Adriana Karembeu, very inspiring. She’s really stunning, and I decided I wanted to create a CG model to have a similar beauty.

I started as usual with my “default” low poly base mesh, which I modify with each new project to suit my needs. I rigged the model with a biped and started to pose her as I desired, using references to achieve a natural posture

(**Fig.03**). I tweaked the pose, changed some of the proportions and fixed the model where it was necessary. This stage was critical and I probably spent most of the time right here. I was also working on a very old laptop at this part of the process because I was away on vacation, so when I got back home I took her into ZBrush to add further details and make some anatomical corrections (**Fig.04 – 06**). I wanted her to look natural, as well as very beautiful (**Fig.07**).

Making the cloth drape across her arms and around her back was a very interesting part of the process, and I probably wouldn’t mention it if it hadn’t turned out as well as it did. I started off thinking about sculpting it, but then decided to do a simulation instead to get a more natural look to the cloth. The main issue with this was



Fig.06

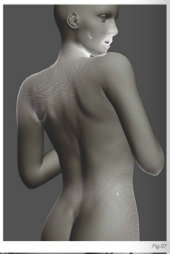


Fig.07

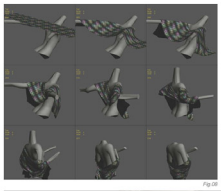


Fig.08

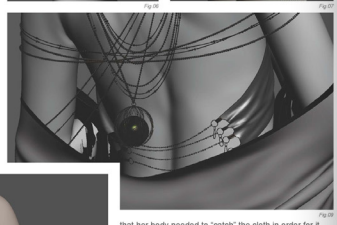


Fig.09

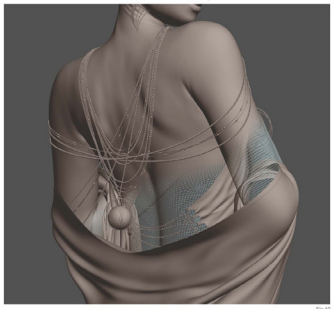


Fig.10

that her body needed to “catch” the cloth in order for it to naturally simulate on the model, so to get around this I basically made a morph between the “catch” pose and the original pose (**Fig.08**). I needed to tweak a lot of the morph’s timing and the simulation parameters, but what I achieved as the end result was a natural looking, perfectly unwrapped cloth. This part was also done on my laptop, and because of this I had to optimize a model in order to make the simulations quicker for the previews. To finish up this cloth simulation, I tweaked it and added some minor details.

The chains were made using splines as paths for instant geometry chains. This technique worked out perfectly for me (**Fig.09 – 10**).

For the hair I used the Ornatrix plugin (I personally prefer this to the hair integrated in 3d Studio Max) (**Fig.11**). This was the last time I used this plugin for rendering hair

though, because it proved to have poor compatibility with Mental Ray, and I ended up having to render it separately with the Scanline renderer, which then caused me some trouble when I was in the compositing stage of the image creation. And whilst on the subject of her hair, I had an alternative idea for her to wear her hair loose, but I ended up leaving this idea behind and opting for the pinned up style, as it didn’t look very interesting when worn down.



Fig.11

Texturing

When I started unwrapping the model I had a fixed perspective, so I decided to unwrap her so that none of the seams would be seen by the camera (**Fig.12**). This eliminated the problem of texture blending the seams, and before I started painting the skin textures, I first configured a skin shader (**Fig.13**). I then started to paint tones of color for her skin and makeup, detailing the skin with various brushes to imply imperfections and give the texture more realistic qualities (**Fig.14 – 16**).

The cloth texture was made by mixing a mask, a glossy reflective shader, and a standard shader with a falloff,



Fig.12

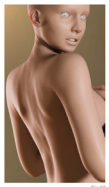


Fig.13

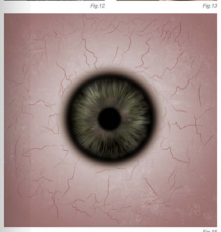


Fig.15

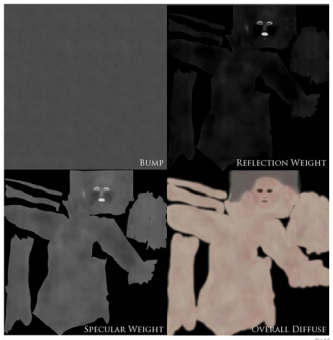
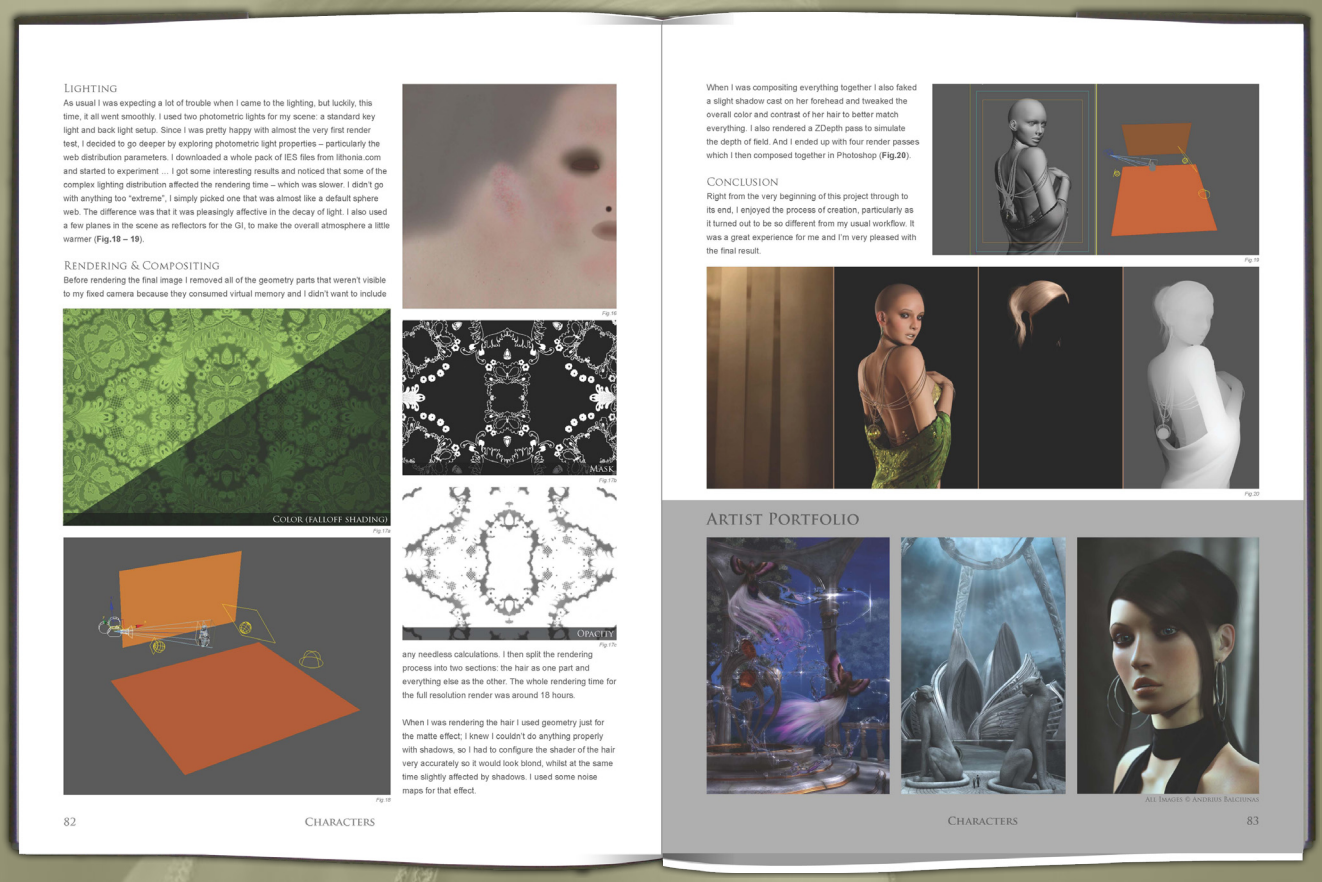


Fig.14

to mimic the look of cloth. I also used an opacity map for some areas to give a feeling of “lightness” to the cloth itself. The texture was painted using various patterns, mixing them together and applying different kaleidoscope effects to achieve something I felt worked. It was pretty much procedural, so I could easily make any mask from it if I needed to (**Fig.17a – c**).

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Lighting

As usual I was expecting a lot of trouble when I came to the lighting, but luckily, this time, it all went smoothly. I used two photometric lights for my scene: a standard key light and back light setup. Since I was pretty happy with almost the very first render test, I decided to go deeper by exploring photometric light properties – particularly the web distribution parameters. I downloaded a whole pack of IES files from lithonia.com and started to experiment ... I got some interesting results and noticed that some of the complex lighting distribution affected the rendering time – which was slower. I didn't go with anything too "extreme", I simply picked one that was almost like a default sphere web. The difference was that it was pleasingly affective in the decay of light. I also used a few planes in the scene as reflectors for the GI, to make the overall atmosphere a little warmer (**Fig.18 – 19**).

Rendering & Compositing

Before rendering the final image I removed all of the geometry parts that weren't visible to my fixed camera because they consumed virtual memory and I didn't want to include any needless calculations. I then split the rendering process into two sections: the hair as one part and everything else as the other. The whole rendering time for the full resolution render was around 18 hours.

When I was rendering the hair I used geometry just for the matte effect; I knew I couldn't do anything properly with shadows, so I had to configure the shader of the hair very accurately so it would look blond, whilst at the same time slightly affected by shadows. I used some noise maps for that effect.

Fig 16

Color (falloff shading)

Fig 17a

Mask

Fig 17b

Opacity

Fig 17c

Fig 18

When I was compositing everything together I also faked a slight shadow cast on her forehead and tweaked the overall color and contrast of her hair to better match everything. I also rendered a ZDepth pass to simulate the depth of field. And I ended up with four render passes which I then composed together in Photoshop (**Fig.20**).

Conclusion

Right from the very beginning of this project through to its end, I enjoyed the process of creation, particularly as it turned out to be so different from my usual workflow. It was a great experience for me and I'm very pleased with the final result.

Fig 19

Fig 20

Artist Portfolio

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Environment Lighting

This five part series will focus on the topic of setting up a variety of lighting rigs that reflect natural lighting at different times of the day and manmade interior lighting. Each of the chapters will use the same base scene as a starting point, and will show a step by step guide to finding a lighting and rendering solution that best reflects the desired lighting situation.

The tutorials will explain the type of lights used and how to set up the parameters along with talking about the different methods of tackling the subject. The manipulation of textures may also be covered in order to turn a daylight scene into night scene for example, as well as a look at some useful post production techniques in Photoshop in order to enhance a final still.

Chapter 1 | June Issue 058
Sunset / Sunrise

Chapter 2 | July Issue 059
Broad Daylight

Chapter 3 | This Issue
Artificial Light - Bright over head light at night

Chapter 4 | Next Issue
Artificial Light (Night-Time) - Mood Lighting (Low-Level - Romantic)

Chapter 5 | October Issue 062
TV-Lit (Night-Time) with Low-Level Lighting

CHAPTER 3 - ARTIFICIAL LIGHT

Software Used: 3ds Max + mental ray

In this tutorial we will be concentrating mainly on illuminating the scene with artificial overhead light (i.e. chandelier). Having previously worked on the textures and shaders, this scene will be fairly simple compared to its predecessors.

The focus will be on the parameters of the light source, and how the existing shaders should react to it. The main objective of this exercise is to have the scene with the correct shadows, enough luminance and depth; to be composited later in Photoshop. Although mental ray is powerful enough to have the final image looking as good as a photograph, it's often recommendable to add final changes, such as brightness and overall color, etc, in Photoshop. This method of working is vital in delivering projects within a certain time frame and budget. As mentioned earlier, it's absolutely essential to have photo references of similar lighting conditions, to cross-reference.

Without further do, let's open the Max file under the name of "Start_Artificial Light_Night-Time_ Bright Overhead_ Lighting.max"

First, we are going to load the mental ray renderer in the scene.

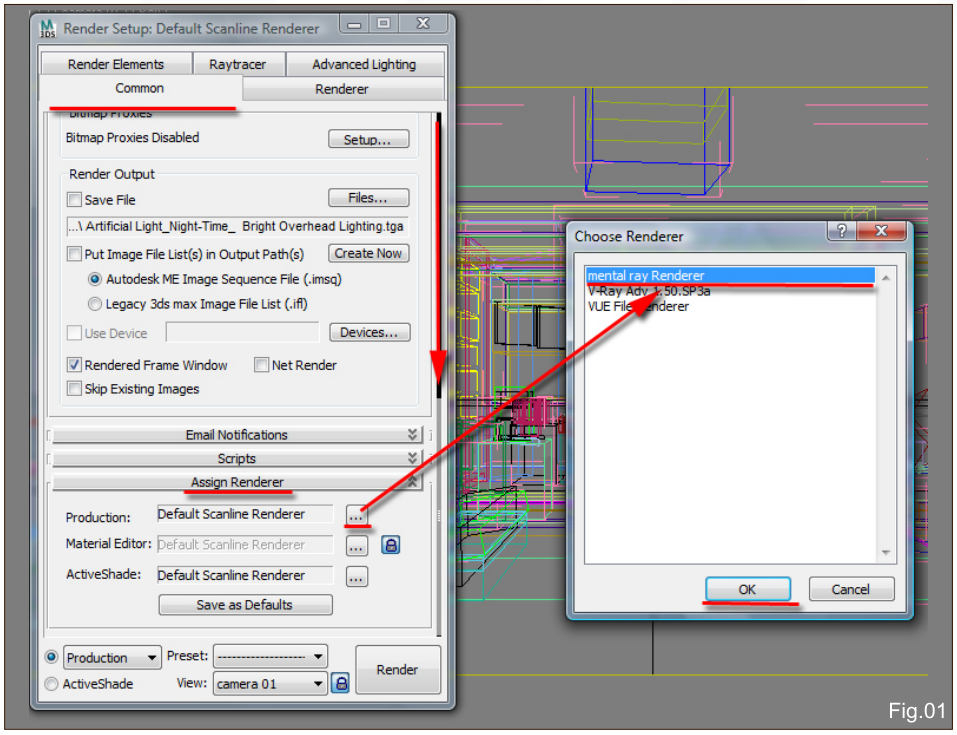


Fig.01

01 - Open the Render Setup dialog (F10).

- In the Common parameters rollout, pan down to the Assign Renderer rollout, and click on its Production toggle to load up the mental ray renderer (**Fig.01**).

02 - Next, we are going to create a photometric light to serve as the light source for the chandelier.

- Maximize the viewport (Alt + W) and open the Create command. This is to fully monitor the creation of the light in all four viewports.

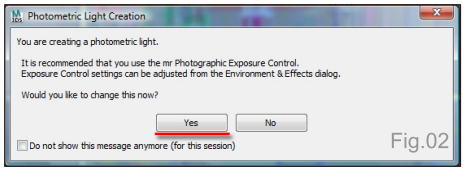
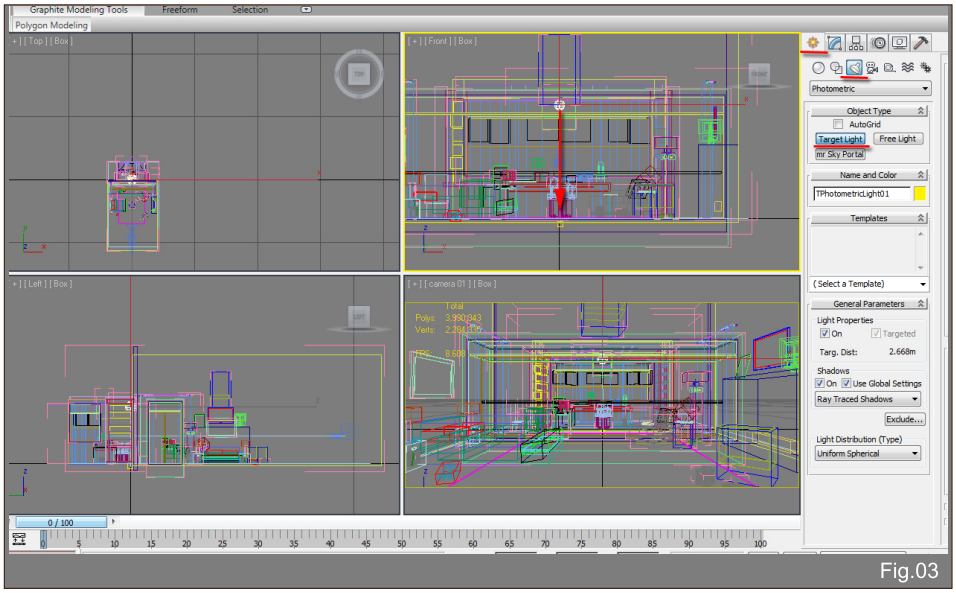


Fig.02

- Open the Lights set, and choose the Target Light type by clicking on its button.
- The mr Photometric Exposure control dialog should the prompted. Click Yes.
- In the front viewport, click and drag the cursor down, to create the light. Click on the Select and Move tool bar to exit creation (**Fig.02 - 03**).


Fig.03

03 - Now that the light has been created, open the Modify panel.

- Select the 4ft Pendant Fluorescent (web) from the template rollout.
- With the light's target now set, disable the Targeted function on the General Parameters rollout. This is to provide better flexibility when moving the light source.
- In the Shadows group, change it to Ray Traced Shadows type. Mental ray works best with ray traced shadows.
- By default, the light distribution is set to

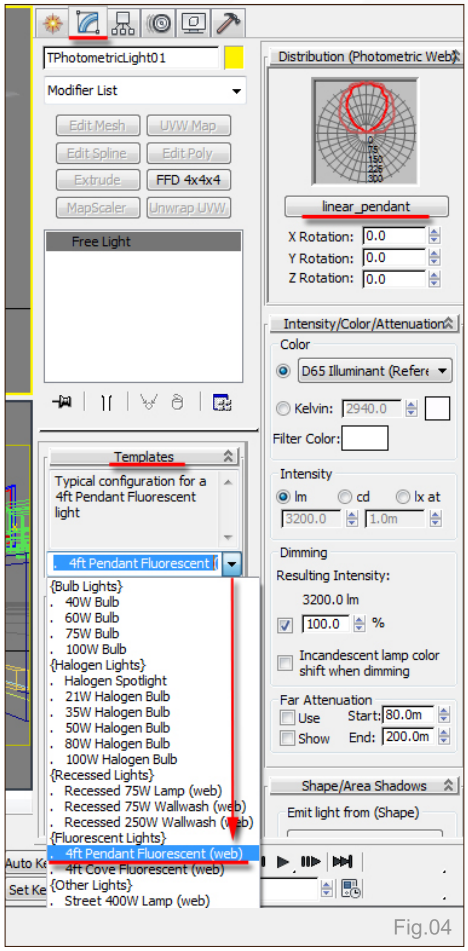


Fig.04

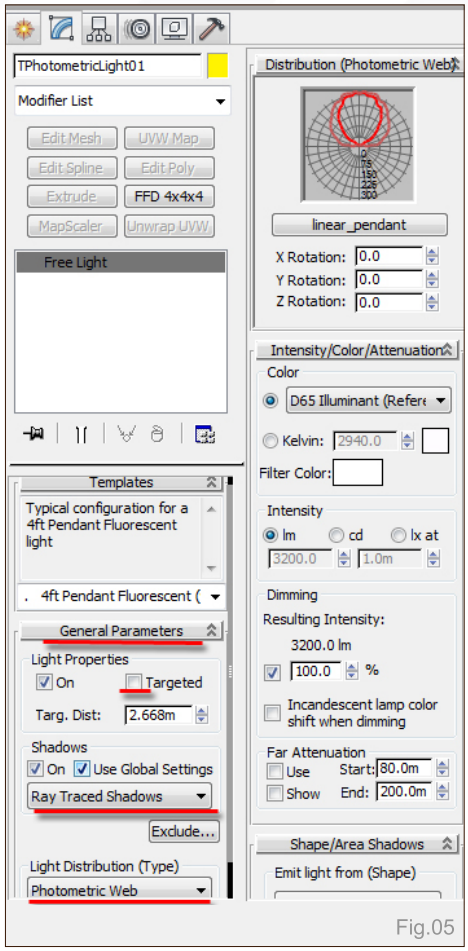
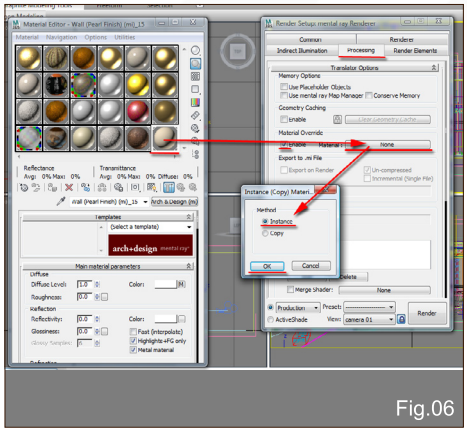


Fig.05


Fig.06

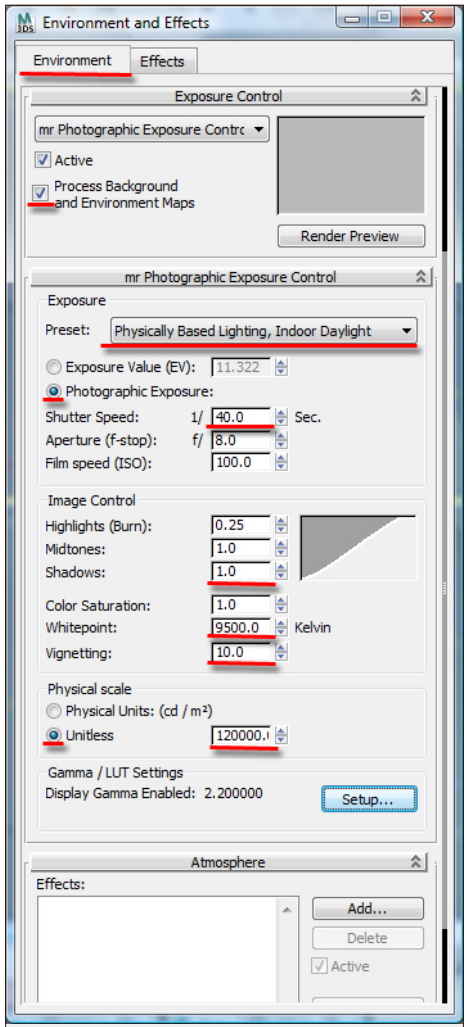


Fig.07

Photometric Web, and its distribution type is Linear_pendant (**Fig.04 – 05**).

04 - Prior to test rendering, we are going to enable the Material Override, for quick test renders.

- Open the Material Editor dialog and select the “wall (pearl finish) (mi)_15” material slot.
- On the Processing parameters rollout of the Render Setup dialog, check the Enable Material Override function.
- Back in the Material Editor dialog, drag the “wall (pearl finish) (mi)_15” and drop it on the Material Override toggle.
- Accept the Instance copy method. Open the mental ray message window and test render.

Accept any missing map coordinates (**Fig.06**).

05 - The light seems to be a bit far away from the chandelier.

- Move it to the top of the chandelier (i.e. X= -0.002; Y=-3.995; Z=83.031).
- Next, open the Environment and Effects dialog and change the exposure preset to Physically based lighting, indoor daylight.
- Also, change the shutter speed to about 40 to reduce the brightness, and enable Process background and environment maps.
- Increase the Shadows value to 1.0 as this adds more depth to the scene.
- As done previously, change the Whitepoint to 9500.0, and the Vignetting to 10.0.
- Finally, change the Physical scale to Unitless, and set it to 120000.0. Note that, the gamma settings are already set to 2.2. Then test render again (**Fig.07**).

06 - The render seems a bit too dark with sharp shadows. Next, we are going to change the intensity of the light and its emitting shape.

- While the light is still selected, in the Modify parameters, change the Dimming Resulting Intensity to about 8000.0.
- In the Shape/area Shadows group, change the Emit light from (shape) to Disc, from the list. This was chosen to help emulate the light source in question.
- Increase its shadow Radius to about 1.0. Higher values equal softer shadows (and

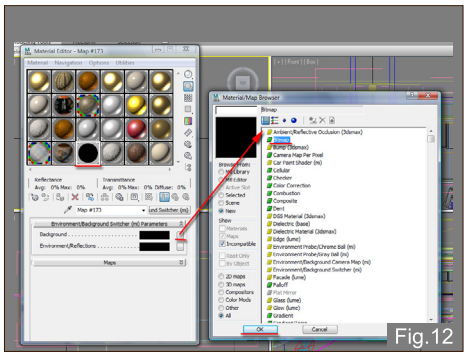
increases rendering times) (**Fig.08 – 09**).

07 - The render is now looking bright and balanced. The next step is to apply an environment map to the background.

- Click on the Environment Map toggle, and choose the "environment/background switcher (mi)" from the Material/map Browser dialog list.
- Once loaded, drag and drop it onto the Material Editor. Choose the Instance copy method (**Fig.10 – 11**).

08 - Its parameters should load up. In the "background" toggle, apply the bitmap named "outside Big_darker2.jpeg". This bitmap is a night version of the original environment map applied earlier (**Fig.12 – 13**).

09 - The bitmap parameters should load up. Its display in the Material Editor slot seems tiled. As previously done, we are going to disable the Use Real-World scale function and


Fig.12

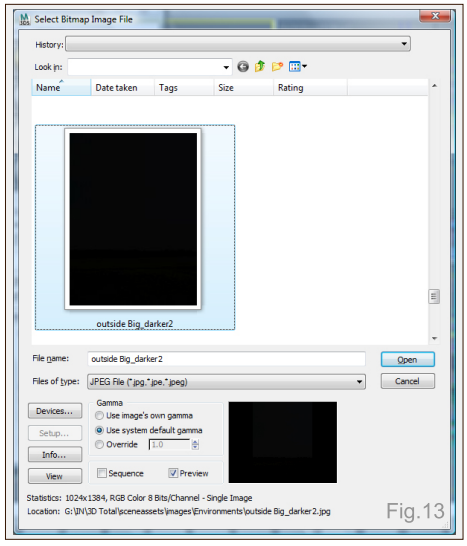


Fig.13

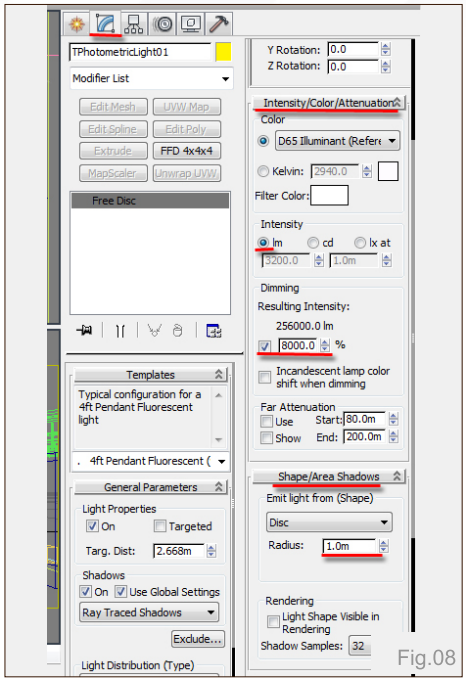


Fig.08

tile its current coordinates to fit the viewport proportions.

- First, enable the Texture type mapping in order to disable the Use Real-World scale function.
- Once disabled change it back to Environment type and select Screen from list.
- Increase the V offset value to 0.93 and the tiling value to 0.2 (**Fig.14**). Then test render to see the results.

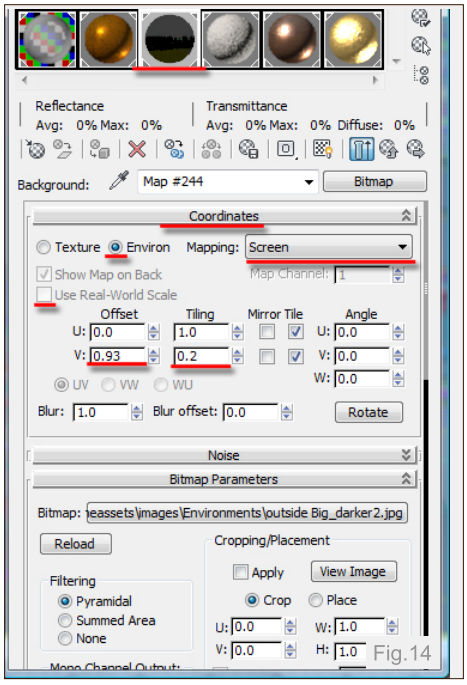
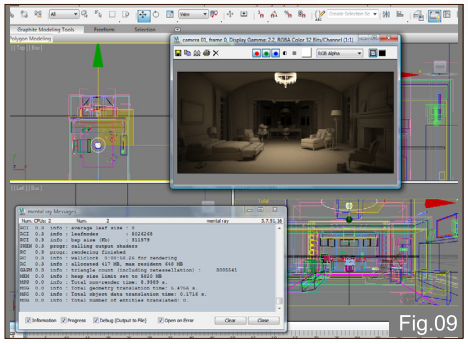
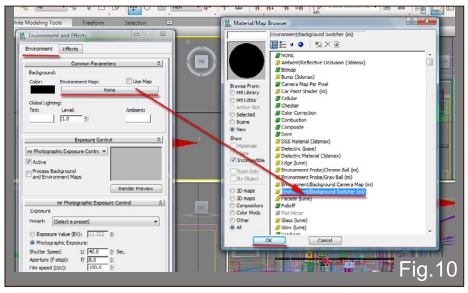
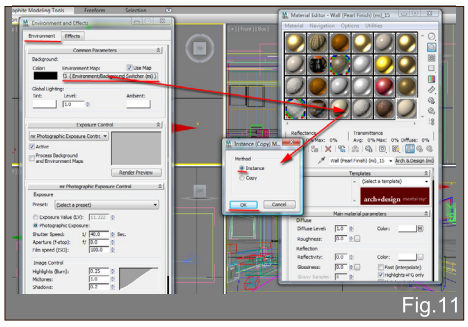


Fig.14


Fig.09


Fig.10


Fig.11

10 - It fits quite well in the environment, but the bitmap seems a bit too dark. Pan down to the Output rollout and increase its RGB level to 2.0 and test render it again (**Fig.15**).

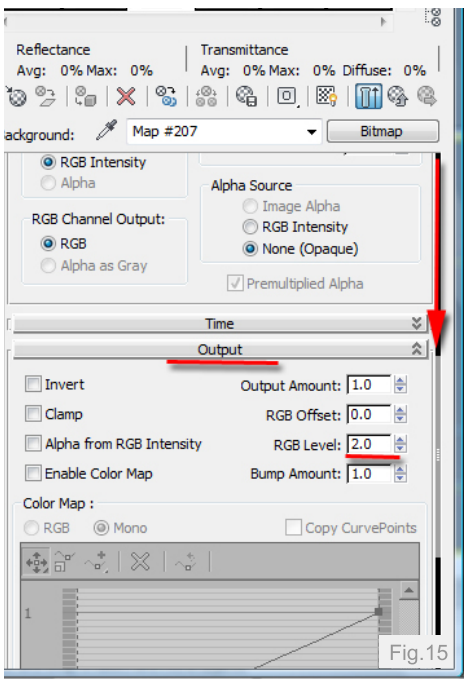


Fig.15

11 - Back in the Environment/background switcher (mi) parameters, apply the Environment probe/chrome ball (mi) to the Environment/ reflections toggle. Next, we are going to copy and paste the background bitmap onto the Chrome/mirr toggle (**Fig.16 – 17**).

12 - For the purpose of this exercise, we are simply going to copy and paste the background bitmap onto the Chrome/mirr toggle.

- Click on Go To Parent to return to the main Environment/background switcher (mi) parameters.
- Right-click on the Background toggle and choose Copy from the pop up list.
- Enter the Environment/reflections toggle and paste it onto the Chrome/mirr toggle. The choice of pasting the bitmap onto the toggle was made because it retains the original coordinate parameters and because these parameters are editable.
- Finally, change the Reverse Gamma Correction value to 2.2 (**Fig.18 – 20**).

13 - One would normally increase the multiplier values in order to add brightness to the reflections, however due to the bitmap being dark; we are going to fiddle with its RGB level value instead.

- Enter the Environment/Reflections bitmap coordinates.
- Pan down to the Output rollout and increase the RGB level value to about 30.
- Before test rendering, we are going to disable the Material Override function and increase the FG Diffuse Bounces to 1 (**Fig.21 – 22**).

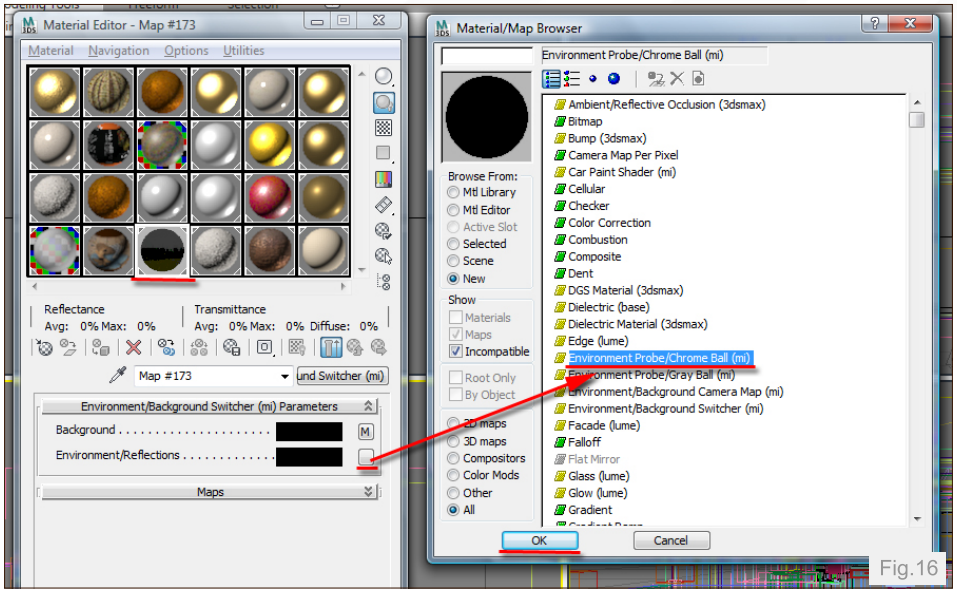


Fig.16

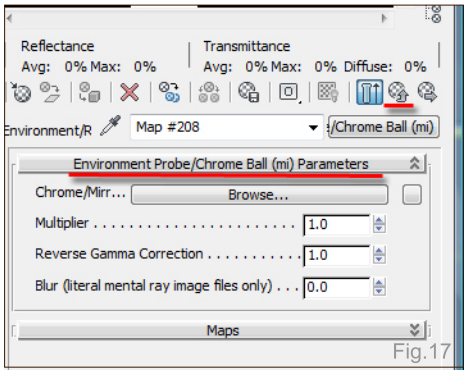


Fig.17

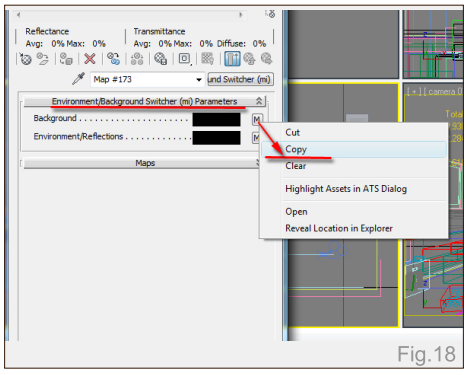


Fig.18

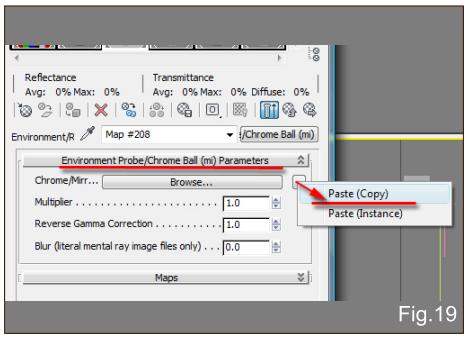


Fig.19

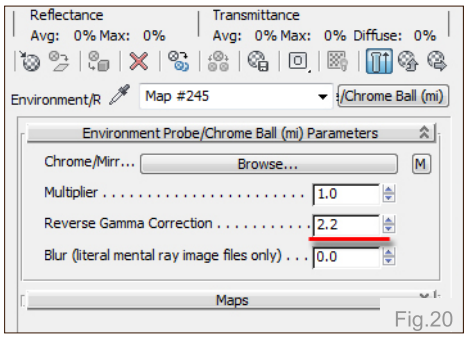
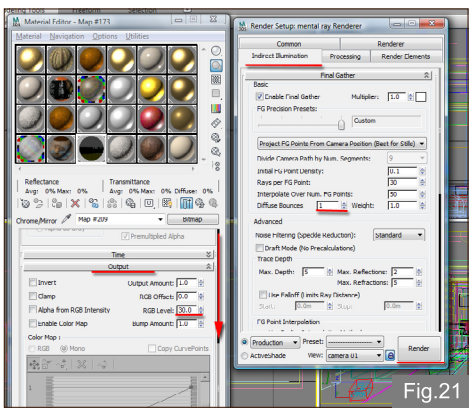


Fig.20


Fig.21

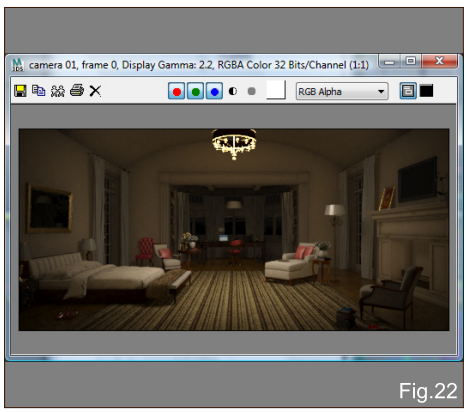


Fig.22

14 - The render is looking nice and bright, however the chandelier seems slightly over lit. Also, the mirror reflection doesn't seem to have the same intensity of brightness as the outside environment. Finally, one can change the light's current color to a warmer yellow, if desired.

- Back in the Chrome/mirr bitmap Output parameters, increase the RGB level value to about 180.
- In the scene select the parts of the chandelier that are over lit (i.e. object 4203).
- In the material slot, select the slot named

"copper (mi)_19".

- Since the same material had been applied to a number of other objects in the scene, we are going to create a new one, by dragging it to a new slot and renaming it (i.e. "copper chandelier (mi)_19").
- The main cause of its brightness is the light source being too close to the chandelier and the original Relative Intensity of Highlights value being 20.0. Change it to about 3.0 and assign the new material (**Fig.23**).

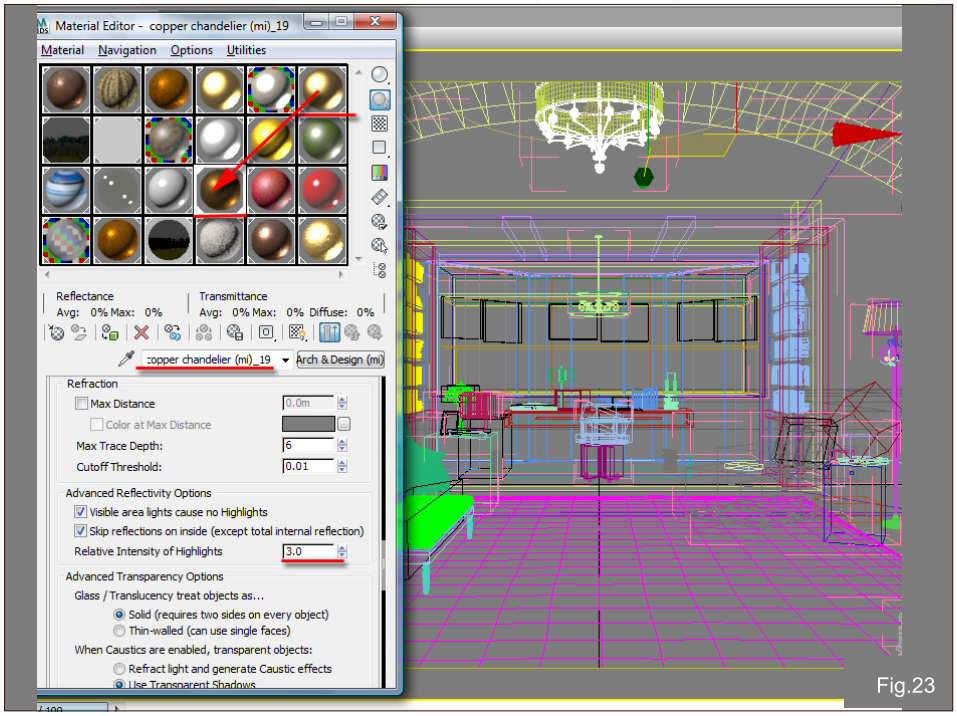


Fig.23

15 - Next, change the light's Filter color to a warm yellow, and darken the "copper chandelier (mi)_19" diffuse and reflection color (**Fig.24 - 26**).

16 - The overall render is looking much better now. One can later increase the brightness in Photoshop if you like. The final step is to save the final gather solution and send the final render.

- In the Indirect Illumination rollout, increase the Initial FG Point Density to about 0.7, to add more depth and clean up any artifacts.
- In the Rays per FG Point, increase it to 150, for better FG precision.
- In the Interpolate over num. FG Points, increase it to about 80, to smooth out FG Blotches etc.
- Pan down to the Reuse (FG and GI disk caching) rollout.

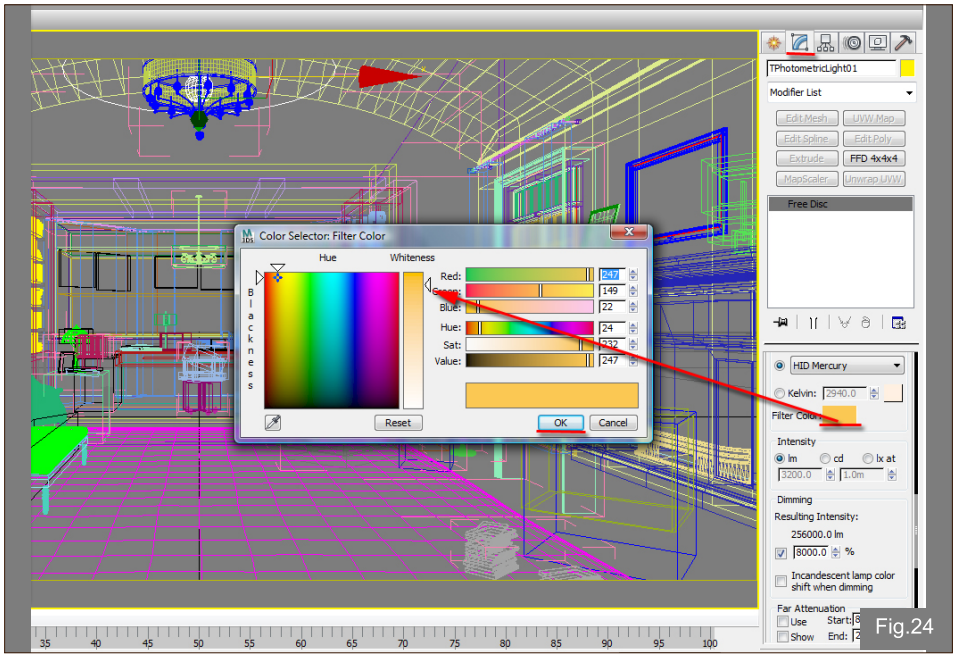


Fig.24

Since we have an idea of the overall look of the image, we are going to skip the final render by

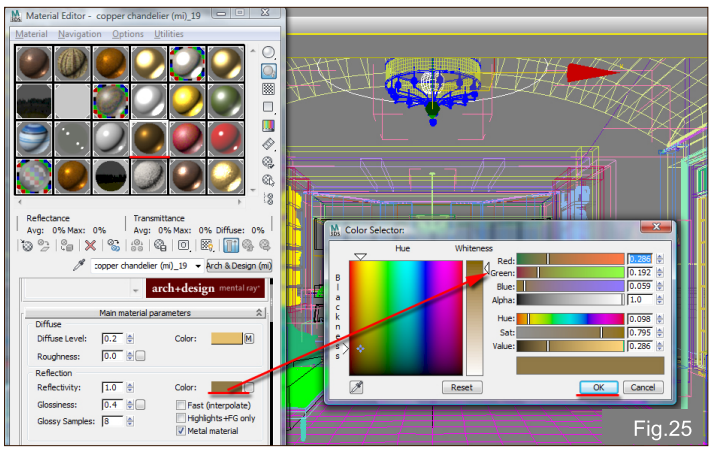


Fig.25

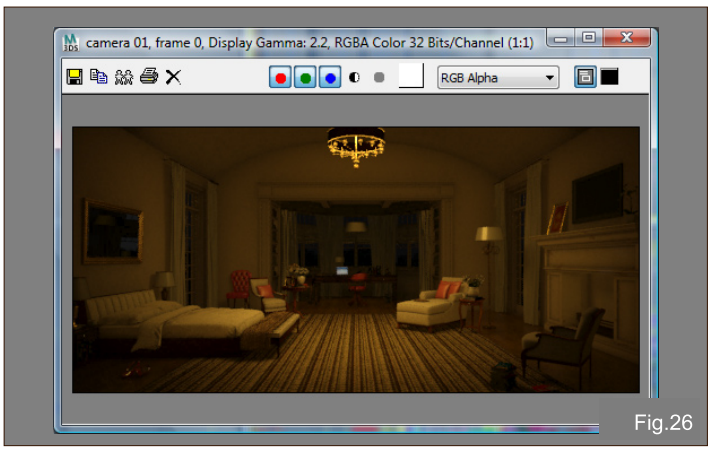


Fig.26

enabling the Calculate FG/GI and Skip Final Rendering function.

- In the Final Gather Map group, change the current preset to Incrementally add FG point to the map files. This function will cache all the final gather map points.
- In the Browse toggle (i.e. ...), set the file location and name, followed by pressing Generate Final Gather Map File Now, to generate the FG map. Ensure to do this in one machine only.
- In the Processing rollout, check the Enable Geometry Caching function. This function will later help speed up the geometry translation process (**Fig.27 – 29**).

17 - Once the FG process is finished, Lock the geometry caching function. Disable the Calculate FG/GI and skip final rendering function. Also, change the final gather map from Incrementally add FG point to map files, to Read FG points only from existing map files (**Fig.30**).

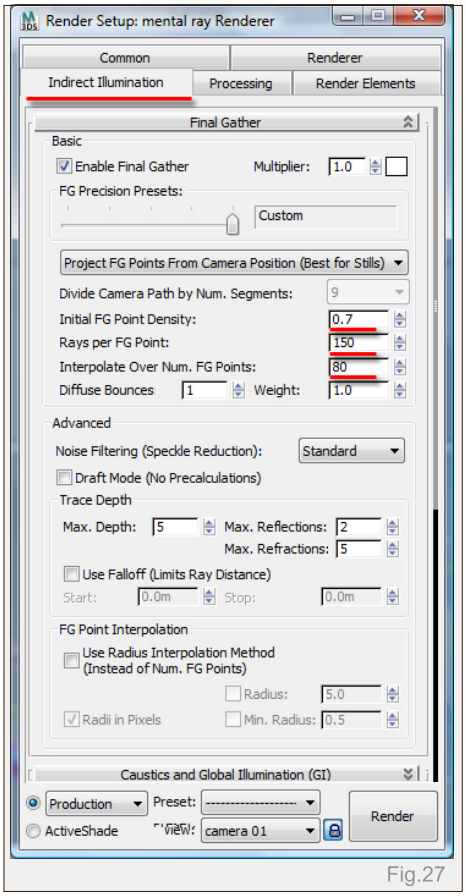


Fig.27

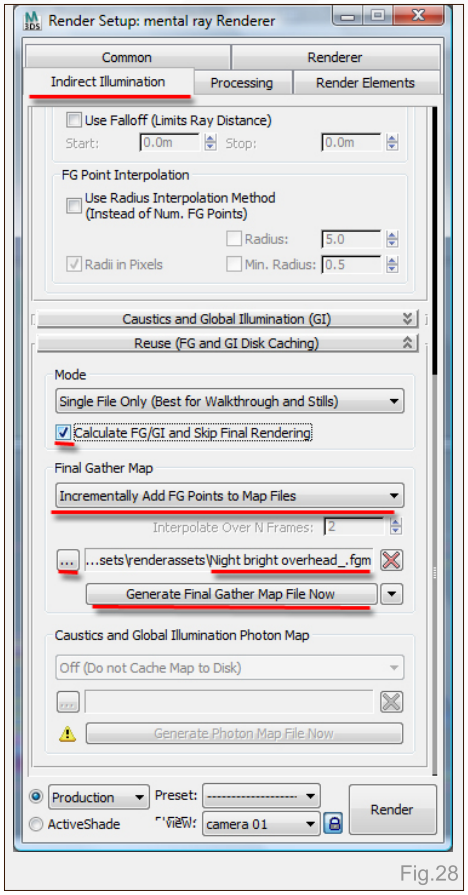


Fig.28

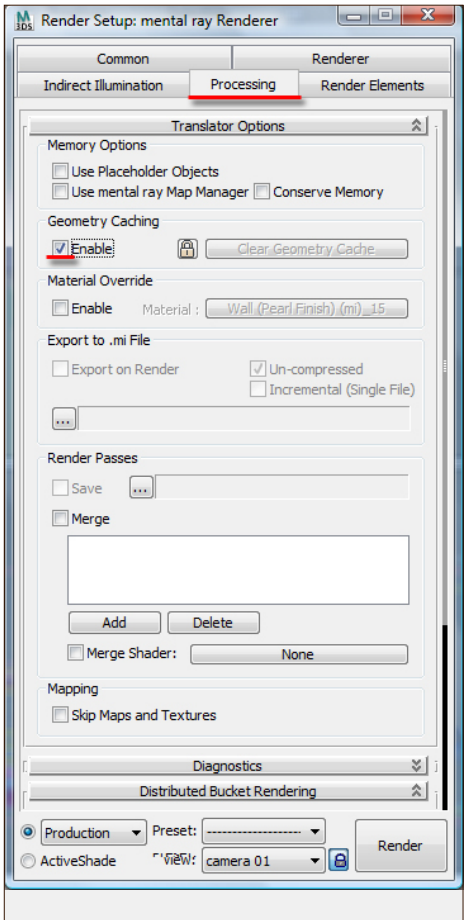


Fig.29

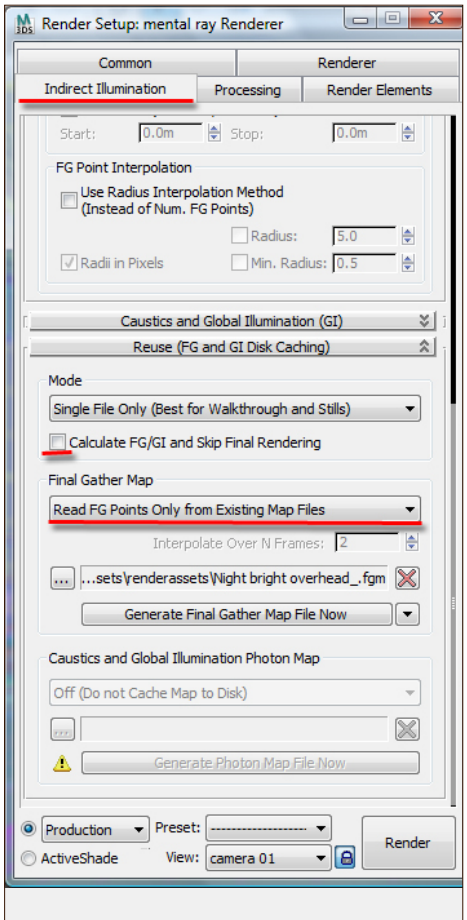


Fig.30

18 - Next we are going to add a volumetric affect coming from the light source. This effect will add extra depth to the scene.

To emulate this, we are going to use the “beam (lume)” shader, from the camera shaders group.

- Open the Renderer parameters rollout.
- Pan down to the Camera Shaders group and click on the Volume toggle.
- Select the “beam (lume)” shader from the Material/Map Browser dialog list. Note that this shader doesn’t contribute much to the rendering time (**Fig.31**).

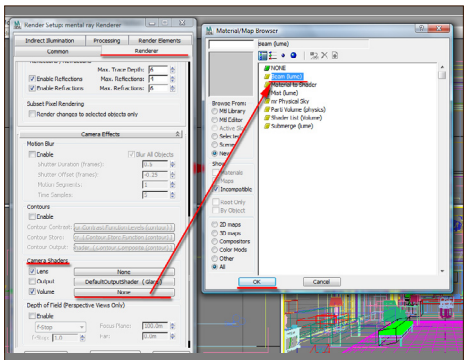


Fig.31

19 - To view and edit its parameters, drag and drop it onto the Material Editor dialog.

- The Color function sets the volumetric color. Change it to match the photometric light source in the scene (i.e. copy and paste it).
- The Density function sets the visibility of the Beam effect. The default value of 5.0 is too big. The rule of thumb is to start with smaller values such as 0.001, and gradually increase it as desired.
- When enabled, the Lights function allows the user to pick the lights which the effect will be applied to. To add lights to the name field, simply click on the Add button and pick the light/s in the scene. To Replace or Delete, simply click the appropriate button and test render it.
- Add “tphotometriclight01” to its name field (**Fig.32**).

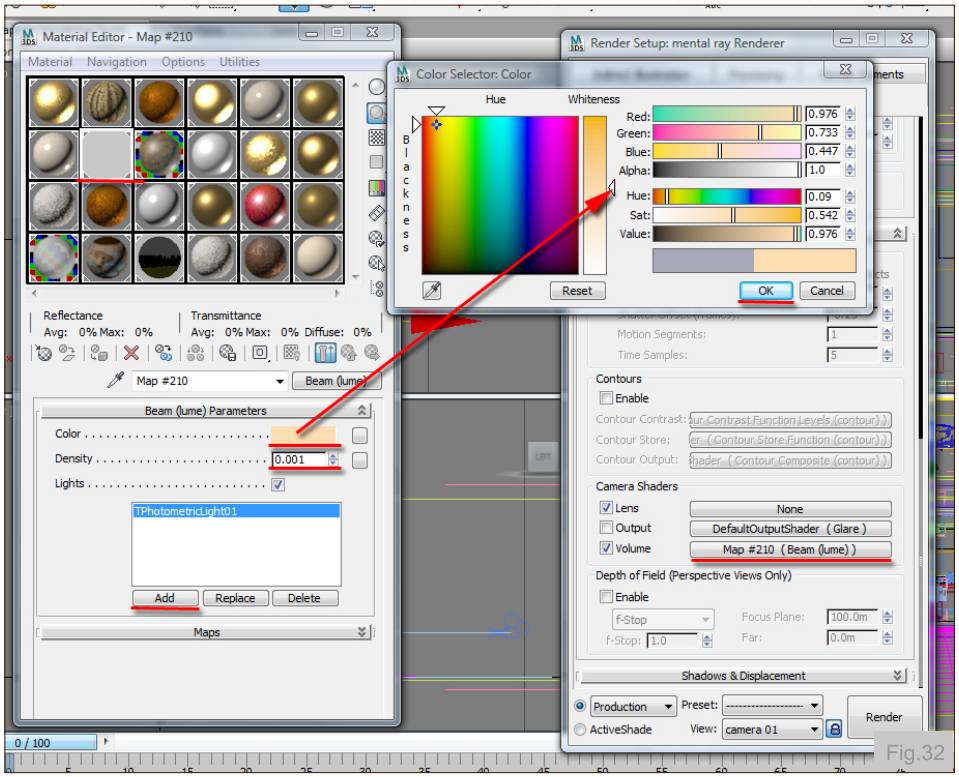


Fig.32

20 - With everything set; we can now adjust the final output size and other general parameters, prior to sending the final render.

- In the Common parameters rollout, lock the image and pixel aspect ratio.

In the Output Size, set the width and height to 3500x1638. This render size is big enough for high resolution prints however; you may try bigger sizes if desired.

- In the Renderer parameters rollout, change the samples per pixel to 1/16 and the filter type to Mitchell. These settings will ensure that the final render is very sharp.
- Try a few Region renders to ensure most material/shaders parameters are rendering without artifacts (**Fig.33 – 34**).

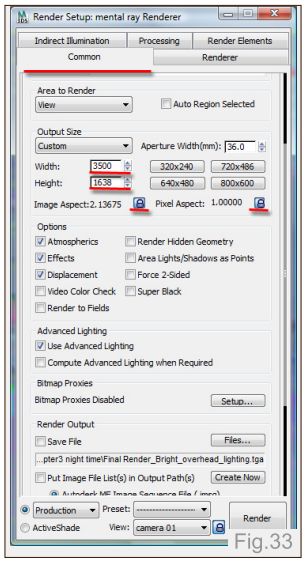


Fig.33

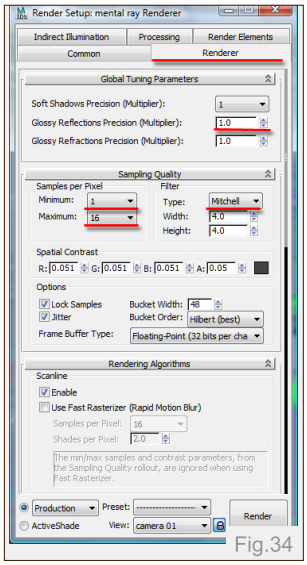


Fig.34

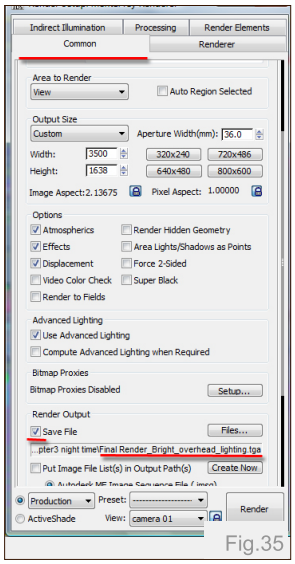


Fig.35

21 - Once satisfied change back the Area to Render to View type.

Enable the Save File in the Render Output group, and click render (**Fig.35 – 36**).

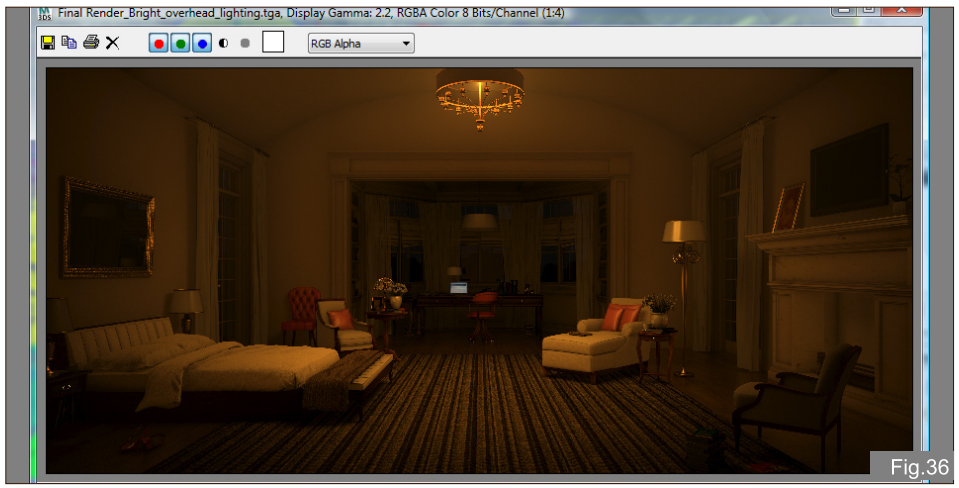
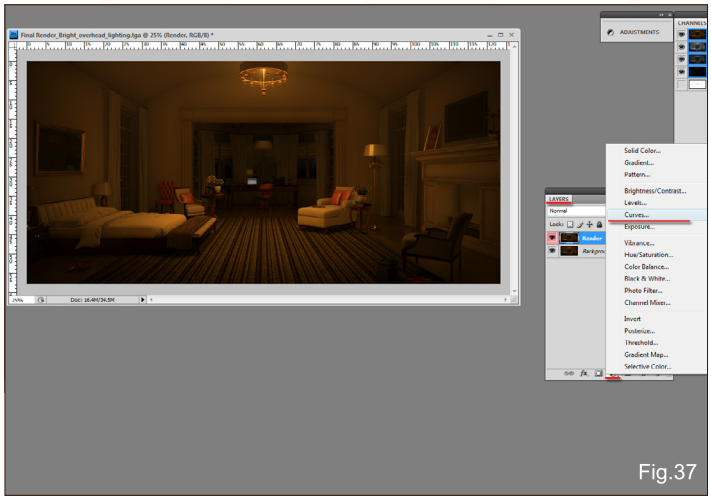
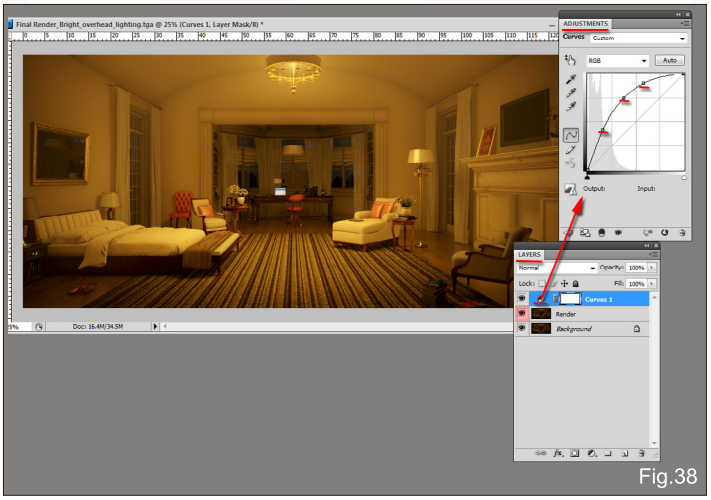


Fig.36


Fig.37

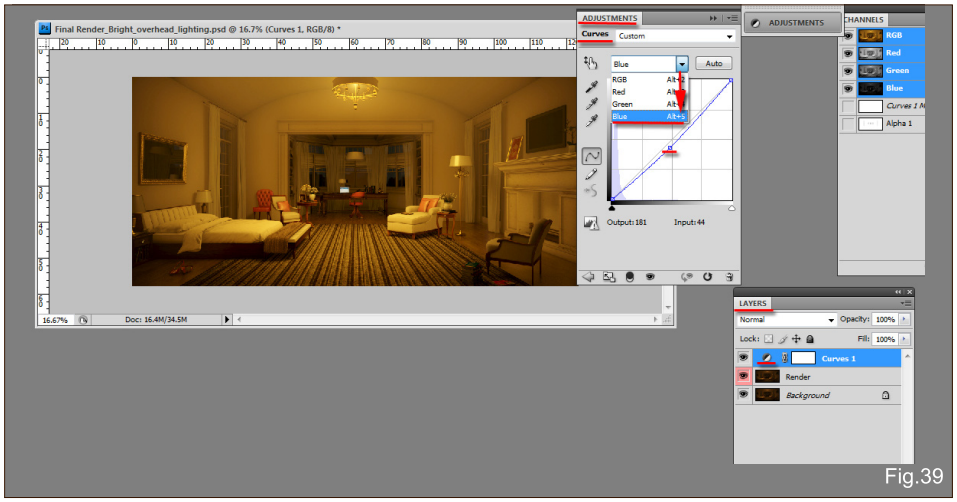

Fig.38

COMPOSITING IN PHOTOSHOP

Photoshop will be used mainly to increase the brightness of the image and to color grade it.

22 - Open the "Final Render_Bright_overhead_lighting.tga" in Photoshop.

23 - First, duplicate the Background layer and name it "render". Also, change its color to red. It is common practice not to work on the original layer. Changing the layer color will help differentiate between layers at a later stage.


Fig.39

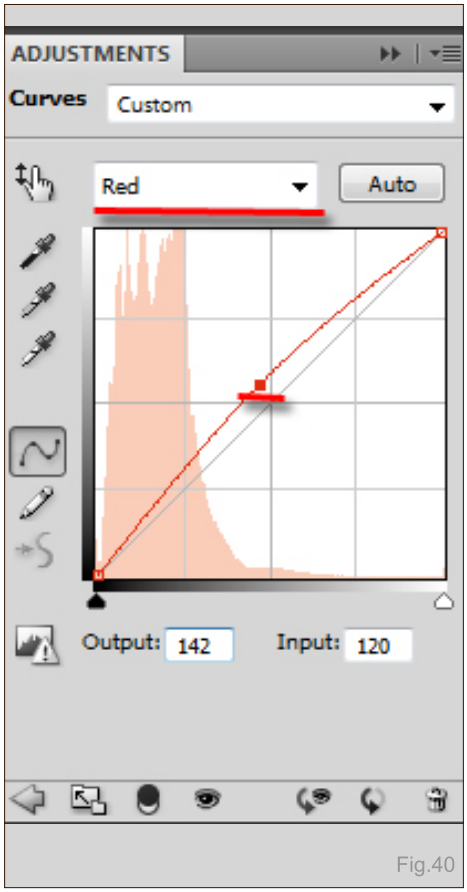


Fig.40

24 - To increase brightness; simply add the Curves Adjustment Layer, by clicking on its button and choosing it, from the pop up list (**Fig.37**).

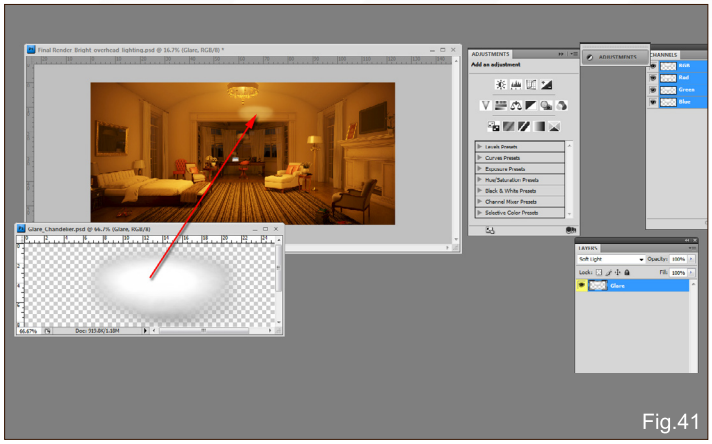
25 - In the adjustment layer, add curve points with the cursor. The dark graph to the left represents the darker areas of the image, and the rest are the brighter areas. Add and move the curve points to a position where the image is substantially brighter. Note how the Beam effect has become more apparent in the render (**Fig.38**).

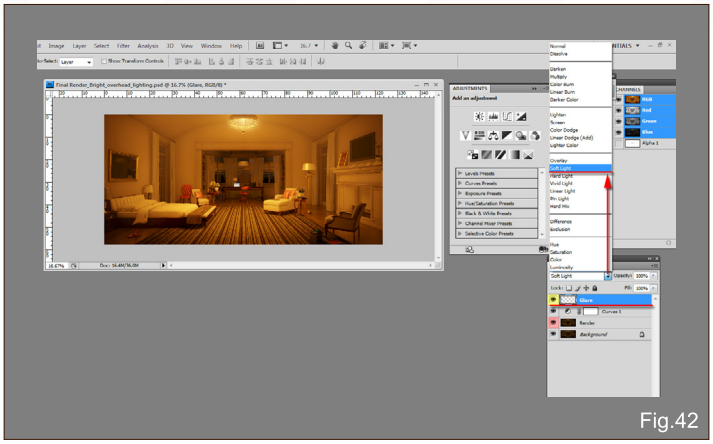
26 - Next, we are going to color grade the image. Interior artificial lighting in households are often perceived to have a warm yellowish tint to them. Most photo references reflect that.

- In the RGB color palette, choose Blue from the list. Add a curve point in the centre of the curve, and move it down towards yellow. The image should now have a nice yellowish tint to it.
- Next we are going add a red hue to the image by selecting the red color palette and adding a point in the centre, Then move it up slightly to add a touch of red (**Fig39 – 40**).

27 - To emphasize the light intensity coming from the chandelier, we are going to add a bit of a glow layer to it.

- Open a file under the name of "glare_chandelier.psd".
- This file consists of one simple blurred out layer. Drag and drop it onto the main working document.
- Move it to the top of the chandelier and use the Soft Light blending mode to integrate it


Fig.41


Fig.42

with the image. Note that one can choose a different blending mode, if desired (**Fig.41 – 42**).

28 - To help accentuate and desaturate certain colours, we are going to add the Hue/Saturation adjustment layer.

- To boost up the red tones, simply select the Red color palette and increase its Saturation to about +32. Also, decrease its Lightness to about -12. Note that although these values worked well, one may try different values if desired.
- In the Yellow color palette, decrease its Saturation to about -8.
- In the Cyan palette, increase it to about +48.
- Finally, in the Master color palette, decrease the saturation to about -25 (**Fig.43 – 44**).

29 - To add extra depth to the image use the Ambient Occlusion (i.e. AO) pre-rendered layer from the previous exercise.

Add it to the top of the Hue/Saturation layer and use the Multiply blending mode to integrate it. Finally, use the Add Vector Mask in conjunction with the brush (B) tool to slightly omit the AO on undesired areas (**Fig.45**).

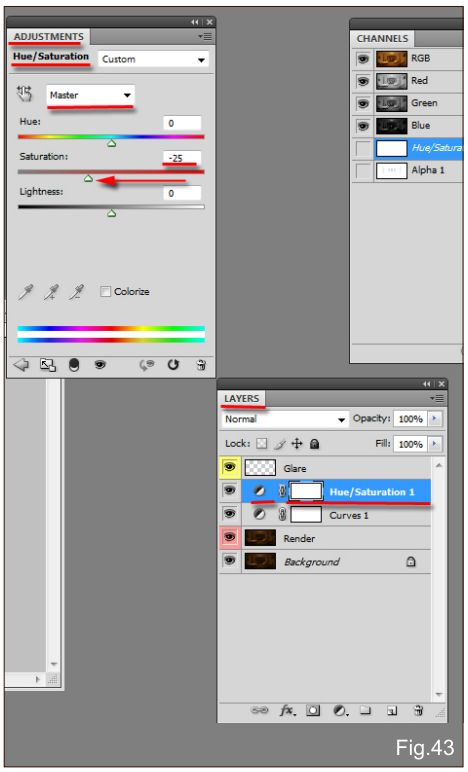


Fig.43

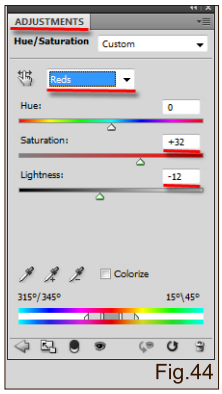
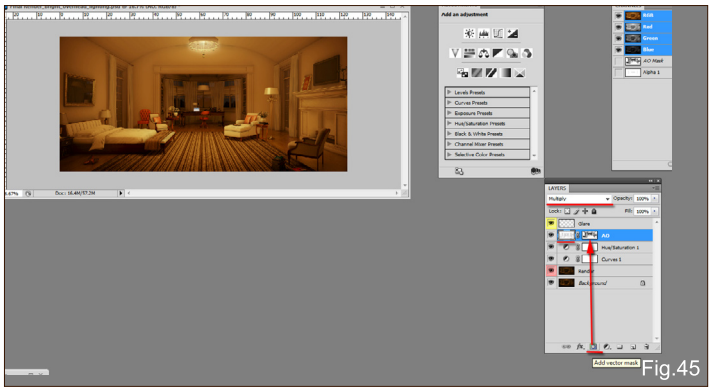
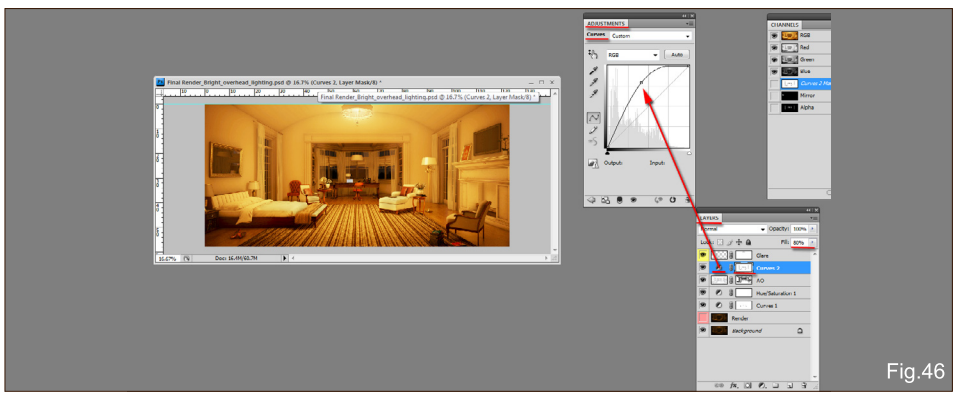


Fig.44


Fig.45

30 - To increase the overall brightness of the image; simply add another Curves adjustment layer on top. Ensure that it's beneath the Glare layer, to avoid over blowing the image (**Fig.46 - 47**).


Fig.46

Mental ray is capable of achieving all the post effects added in Photoshop however, it's prudent to use Photoshop for color grading, brightness, etc, as these effects are often under greater scrutiny for quick feedback by clients.



- FREE SCENE & TEXTURES



Scene created by:

Viktor Fretyán

Textures supplied by:

3DTotal Total Textures

Tutorial by:

Jamie Cardoso

For more from this artist visit:

http://jamiecardoso-mentalray.blogspot.com/

Or contact them:

jamiecardo@hotmail.com





3ds max
+ v-ray

DOWNLOAD RESOURCES

- Free Scene & Textures
This download includes the artist final scene set up + textures

Environment Lighting

This five part series will focus on the topic of setting up a variety of lighting rigs that reflect natural lighting at different times of the day and manmade interior lighting. Each of the chapters will use the same base scene as a starting point, and will show a step by step guide to finding a lighting and rendering solution that best reflects the desired lighting situation.

The tutorials will explain the type of lights used and how to set up the parameters along with talking about the different methods of tackling the subject. The manipulation of textures may also be covered in order to turn a daylight scene into night scene for example, as well as a look at some useful post production techniques in Photoshop in order to enhance a final still.

Chapter 1 | June Issue 058
Sunset / Sunrise

Chapter 2 | July Issue 059
Broad Daylight

Chapter 3 | This Issue
Artificial Light - Bright over head light at night

Chapter 4 | Next Issue
Artificial Light (Night-Time) - Mood Lighting (Low-Level - Romantic)

Chapter 5 | October Issue 062
TV-Lit (Night-Time) with Low-Level Lighting

CHAPTER 3 - ARTIFICIAL LIGHT

Software Used: 3ds Max + V-Ray

Welcome again. Let's get on with the tutorial, and this time we will be doing a night shot. This is going to be much more exciting since there are more light sources and more things to play with regarding colors, shadow and the overall mood. The goal is to render an image with bright overhead lighting and all our lamps will be turned on.

We will set the lighting sources one by one starting with the minor ones like the standing lamp and the smaller desk lamps, and finishing with our chandelier. Why? Because that will be our main light source which will provide the bright light overhead in the room, and I am

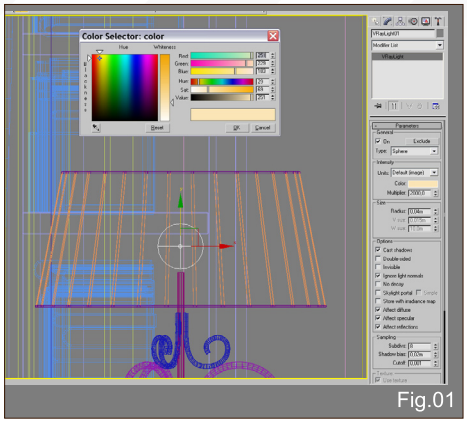
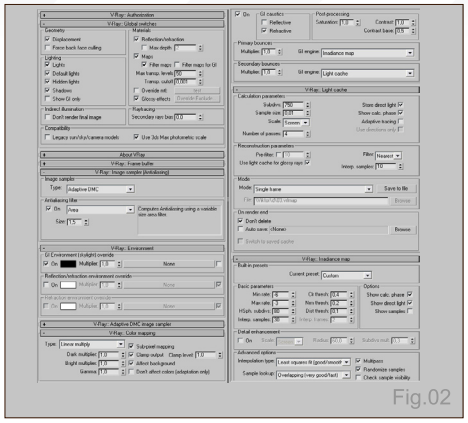


Fig.01


Fig.02

afraid if I start with that I wouldn't be able to set the smaller ones so precisely.

So we are going to go with the standing lamp on the right of the image first. I'm putting a small V-Ray sphere in the light bulb. Since it's a very small lighting source the multiplier should be raised high. Let's start with 2000. The sphere should remain obviously visible and should have an orange warm color. We can leave the rest of the settings on their default setting (**Fig.01**).

Let's see a test render. For test purposes I use these settings (**Fig.02**). We can see that the multiplier is about right but the image is quite burnt in (**Fig.03**). It is very rare that I can afford to use linear color mapping for night shots, although I always try to do so whenever I can. Now let's switch to Reinhard and start by decreasing the burn level to 0.1. This will drastically decrease the burn effect on the render (**Fig.04**). I think it looks ok, so we can move on to the other lights. The scene is quite dark so far but that's ok. We want to keep the minor light sources very subtle.


Fig.03


Fig.04

Now what bothers me is the dark area in the back so let's put some light there right away. Since there is a bulb in the lamp we need to delete it, or just go to object properties and remove the tick in the Receive And Cast Shadow properties. The radius should be much smaller here since we would like to see sharper shadows. Therefore the multiplier should be higher (**Fig.05**).

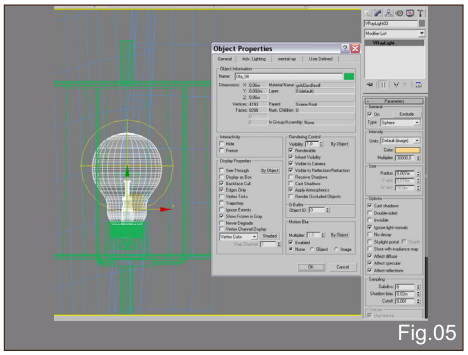


Fig.05

The color of the lights could contain much more character but I am used to adding all the color balance after the rendering in the post process part anyway so I'm going to leave it like this for now. Maybe the multiplier can go even lower here to keep the light even more subtle. Let's instance it to the left where that nice Tiffany lamp is. They are about the same size so they should provide the same light. And what do you know? This one has a bulb similar to the previous light so we do the same thing here as before: delete it before adding the light.

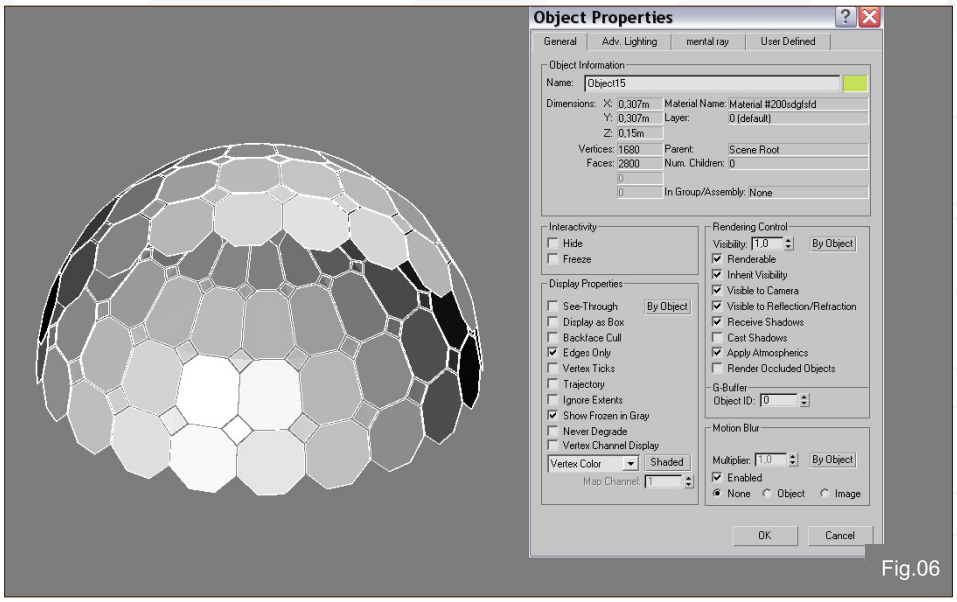


Fig.06

One other thing I did here is to make sure the glass part casts no shadows (**Fig.06**). This way not only is the render time going to be shorter, but the shadows provided by the frame of the lamp are going to be better (**Fig.07**).


Fig.07

So far so good. Only two smaller lamps left on the left. Let's copy our V-Ray light sphere there as well (not instance this time since these lamps are slightly bigger so they might need different settings). Well actually looking at the first test render it looks quite ok the way it is, but of course some minor changes need to be done. First of all the intensity is just too high. It burns near the walls and also the shadows are too sharp so the radius should be higher (**Fig.08**). We have to change these numbers at the same


Fig.08

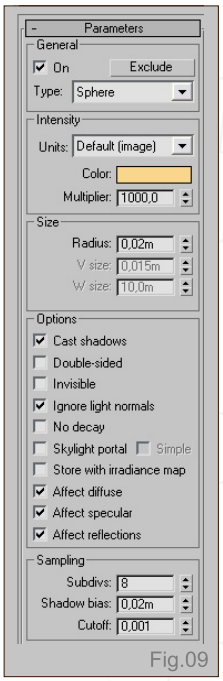
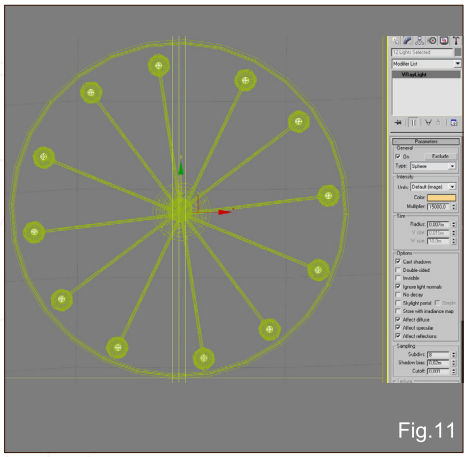


Fig.09

time because they depend on each other: If we want to raise the radius it will result in automatically raising the intensity, so we have to decrease the intensity multiplier much more than we originally planned to do (**Fig.09**). Let's see another try (**Fig.10**). I think it's really good so far. Maybe the room has too much light than it should considering the ceiling light should provide the majority, but it's still acceptable. Let's move on to the ceiling lights.


Fig.10

For those we use V-Ray light spheres as well. For a start let's see what happens when we copy a V-Ray light sphere from the desk lamp there and instance that a couple times around the chandeliers (**Fig.11**). Since there are so many light sources in one bunch let's decrease the multiplier to 15 000 from 30 000. Let's see how that looks (**Fig.12**).


Fig.11

It looks just fine although it's a bit unnatural with all these lights turned on. But I think the end result turned out pretty well after some retouching in Photoshop (**Fig.13**).

See you all next month!

Tutorial by:
VIKTOR FRETYÁN
For more from this artist visit:
http://radicjoe.cgsociety.org/gallery/
Or contact them at:
radicjoe@yahoo.com

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Fig.12





Fig.13



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Scene Created by: Viktor Fretyán | Tutorial Written by Fredi Voß

Environment Lighting

This five part series will focus on the topic of setting up a variety of lighting rigs that reflect natural lighting at different times of the day and manmade interior lighting. Each of the chapters will use the same base scene as a starting point, and will show a step by step guide to finding a lighting and rendering solution that best reflects the desired lighting situation.

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Artificial Light (Night-Time) - Mood Lighting (Low-Level - Romantic)

Chapter 5 | October Issue 062
TV-Lit (Night-Time) with Low-Level Lighting

CHAPTER 3 - ARTIFICIAL LIGHT

Software Used: Cinema 4D 11.5

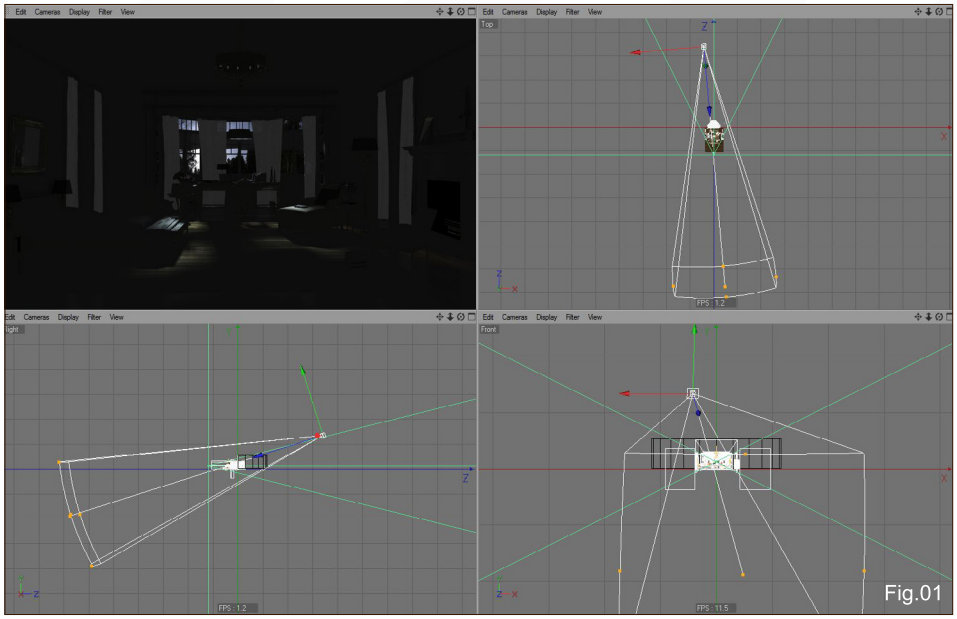
INTRODUCTION:

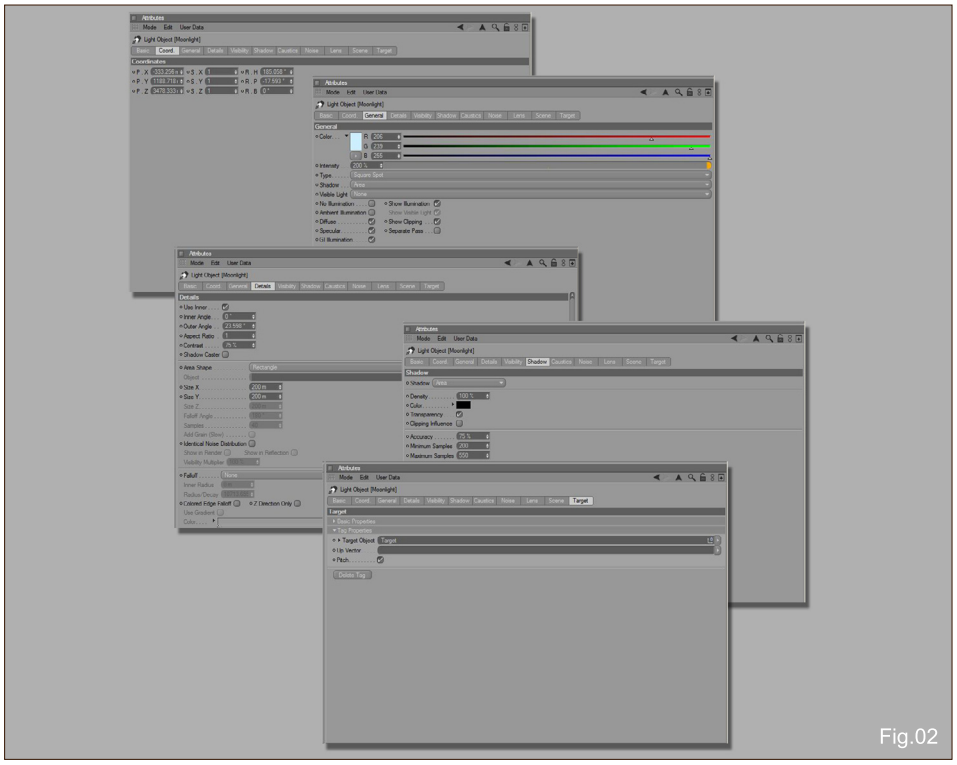
Hello and welcome to the third part of our new indoor lighting tutorial.

The features used here are part of the Advanced Render 3 of release 11.5. Some elements may be reproduced in earlier versions of C4D, but in the earlier releases of Cinema 4D the Global Illumination feature is founded on completely different algorithms, so the results and settings might not work in the same way.

The memory footprints for rendering this scene might be quite big, so the usage of a 64 bit OS is recommended. The render performance strongly depends on the power of your hardware, so give yourself some time for rendering the final image, I`m always trying to find a balance between quality and performance.

Time to start!


Fig.01


Fig.02

RENDER SETTINGS

For the final render I used a width of 1600 pixels. This gives a nice level of definition to the small details. Anti-aliasing is set to Best. For work in progress images you can also use None or Geometry. Using the multipass option for the final render might give you the best result for your image at the end.

At this time of the day we have two main light sources: the moonlight coming from outside and the artificial lights inside the room. For the lighting setup I used conventional light sources and Global Illumination, which are going to play an important role. So let's have a look at the structure of the setup.

MOONLIGHT

I have one light source called "Moonlight". The position is defined according to HDRI in the background. In this case I used the normal HDRI image and scaled it to night time. That's one of the big advantages of using an expanded color depth in high dynamic range images. The moonlight itself has a subtle blue color tone and is created by a square spot shining through the windows. An easy way of finding a perfect focus point is to use a target tag (**Fig.01 – 02**).

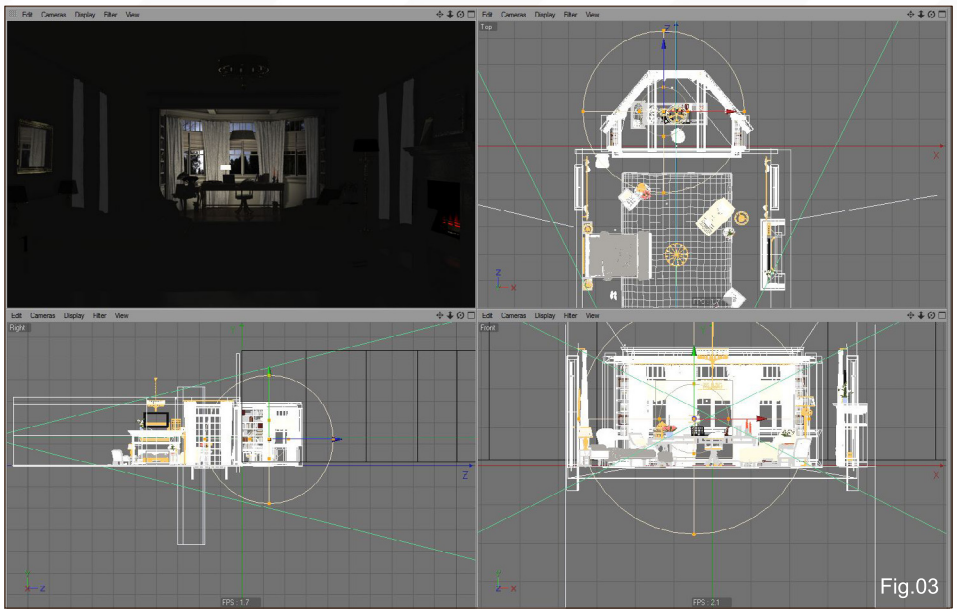
ARTIFICIAL LIGHTS

These lights set the mood of the image. What is important is the way they are set and how the settings are defined as this affects the general appearance of our image. The strength of these lights works together with the Global Illumination in the final render. The single passes might look quiet dark so for the editor views I deactivated the GI feature to get a better impression of the nature of every light source.

LAMP 1

This one is positioned in the desktop lamp in the background near the windows. In

reality the shades of every active lamp are illuminated themselves; as they are made of half-transparent material they can work as a kind of light emitting object as well. I created some materials to simulate this effect in different variations. In some cases I used compositing tags to deactivate the shadows caused by the light shade. In other cases like the Tiffany lamp I used alpha channels to get a shadow dropping effect. You will find these materials and their settings in the scene file (**Fig.03 – 05**). The color range of the desktop lamp is in the yellow area. I wanted to create a warm and cosy mood.


Fig.03

LAMP 2

Almost every light in this scene has a clearly defined linear falloff. Otherwise it would not work in a natural way. No artificial light has an unlimited strength (**Fig.06**).

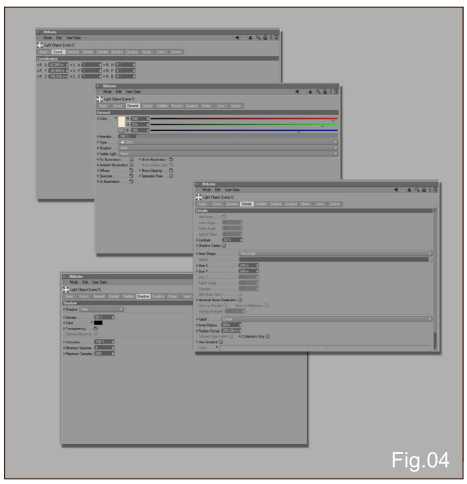
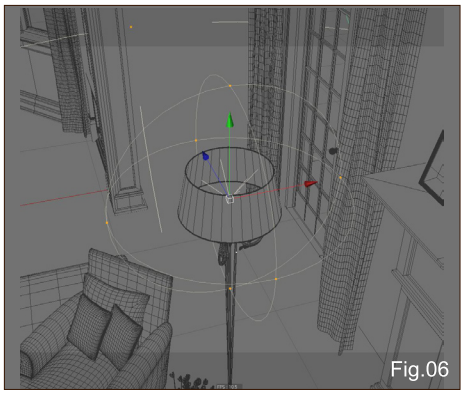

Fig.04

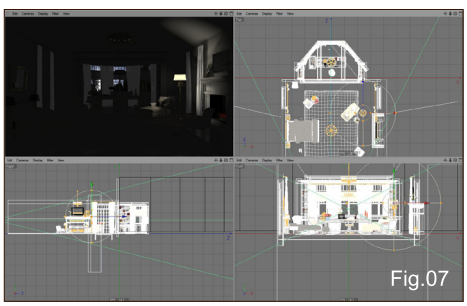

Fig.05

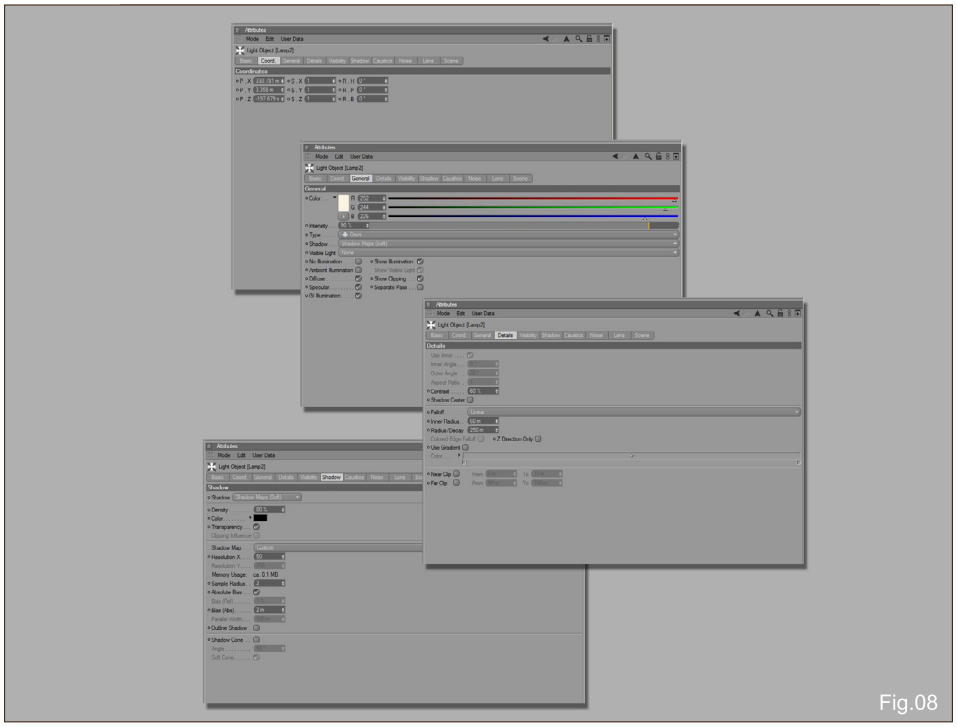
The shade of this lamp is used to create realistic shadows on the walls and other objects. The settings of the soft shadow map are set very low here (**Fig.07 – 08**).

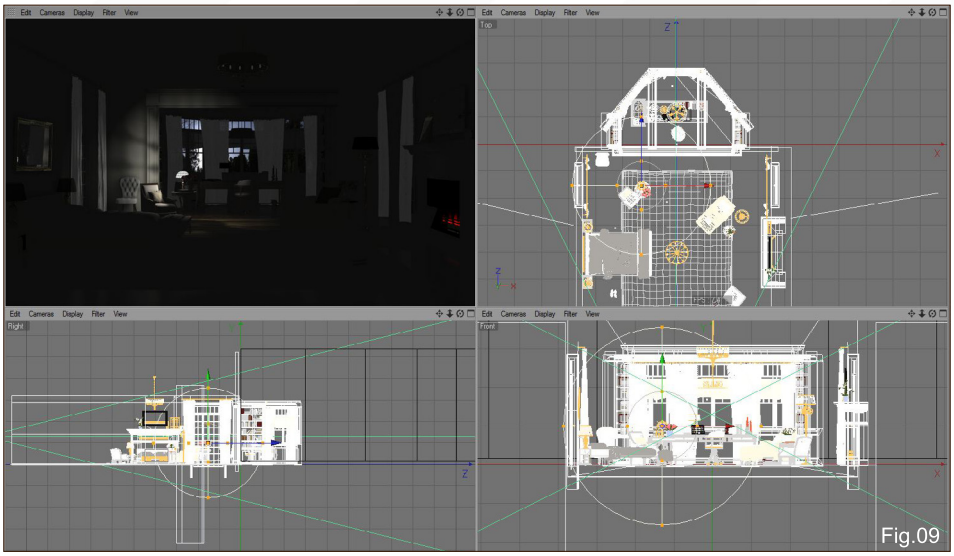
LAMP 3

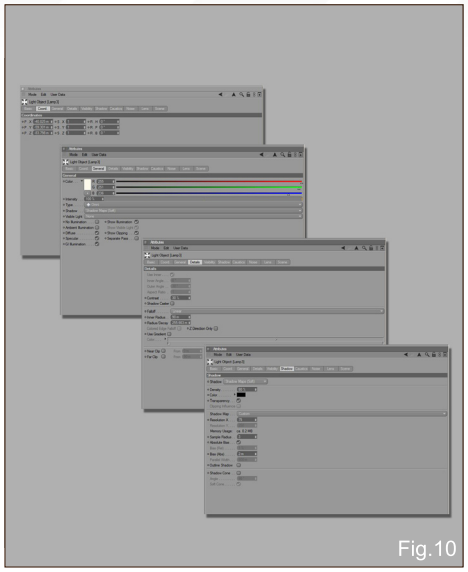
This is the light coming from our little Tiffany lamp. I liked the way it's shadows worked in the scene so I've chosen to use this lamp


Fig.06


Fig.07


Fig.08


Fig.09


Fig.10

rather than activating the laptop monitor on the desk. It would have been irritating in my opinion. In general it is very important to decide which lamps should be used in this kind of environment. Switching all lights on might be quite counterproductive (**Fig.09 – 10**).

Lamps 4 and 5

Switching these lights on gives the composition more balance. These lamps also deliver extra definition on the surfaces in the bed area (**Fig.11 –12**).

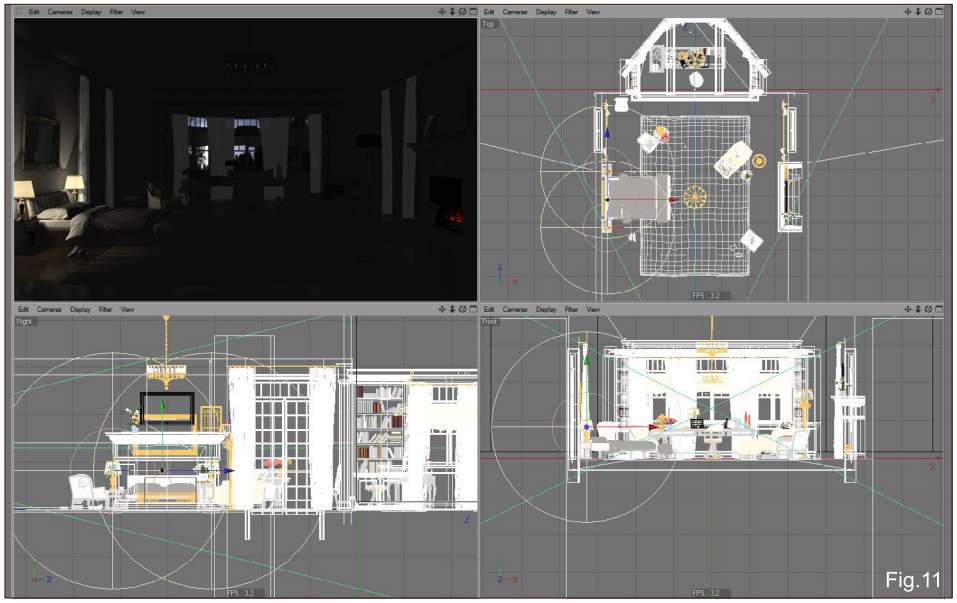
Fire

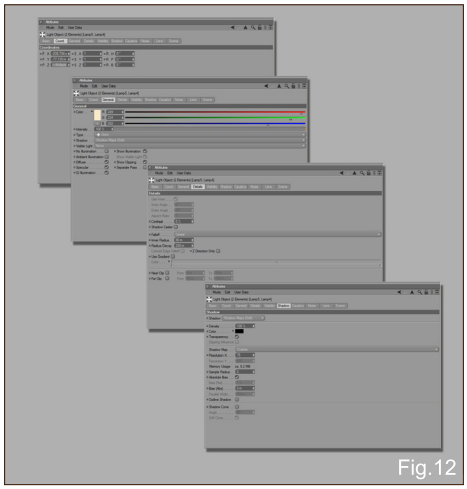
I could not resist using the fireplace in this scene. The light works very nicely on the objects, and it adds to the mood. Unlike the first two chapters in this series most of the light sources I used are omni lights. In most cases spots do a very good job, but in this case omni lights were my first choice. The light coming from the fire is reddish and warm (**Fig.13 –14**).

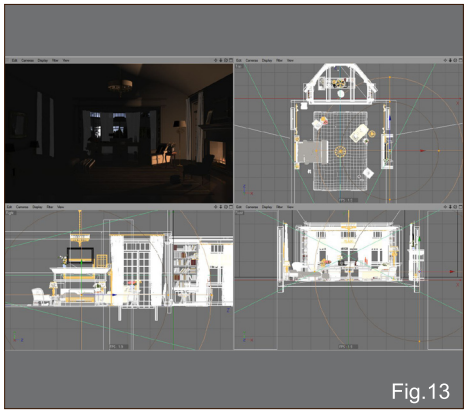
Effect Light

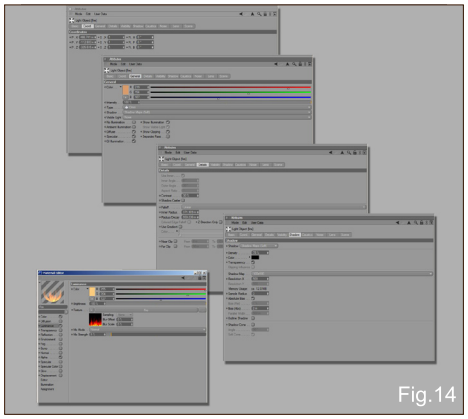
In order to create more definition on certain objects in the area of the desk I used a spot light source which I called “Effect”. Again exclusions do a good job here.

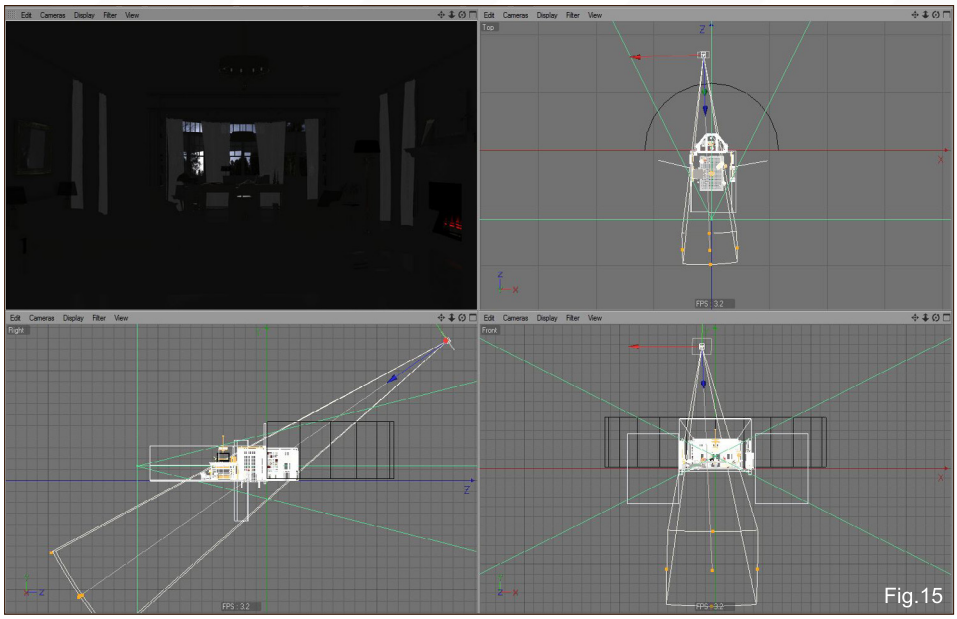
These two lights are not used for the general illumination of the scene, but for getting some “hotspots” on the surfaces of the objects


Fig.11

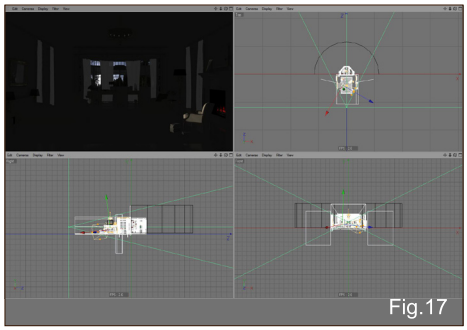

Fig.12


Fig.13


Fig.14

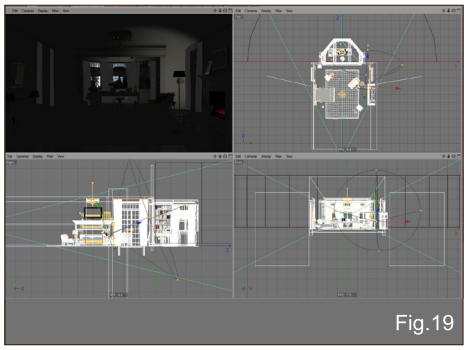

Fig.15

inside the room. They define specularity and reflections in a more intensive way and therefore the three dimensional appearance of the scene is increased. The low resolution of the editor view does not give us a complete vision of how the light is affecting the scene. The bigger the final resolution, the more the effect will be recognisable later on (**Fig.15 –16**).


Fig.17

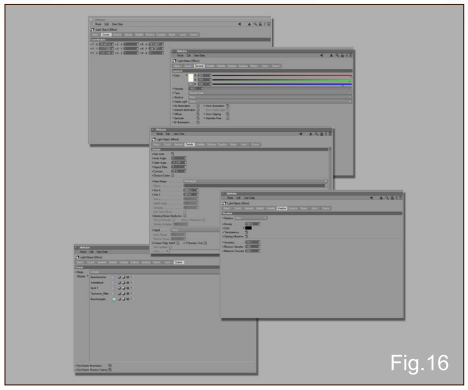
Bounce 1 and 2

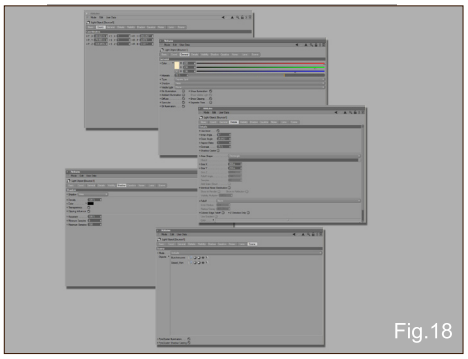
For further corrections I added two bouncers. The other thing you could do is to increase the diffuse depth of the GI later on, but that would definitely have a negative effect on the render time (**Fig.17 –20**).

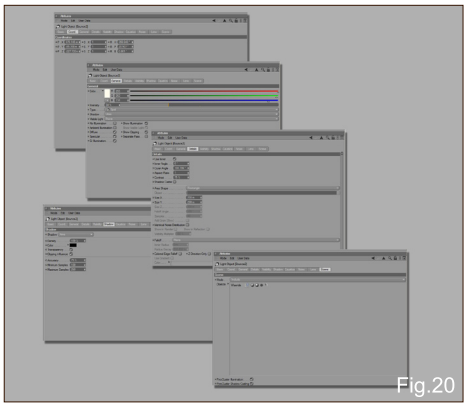

Fig.19

So let's have a look at how the lights work together (**Fig.21**).


Fig.21

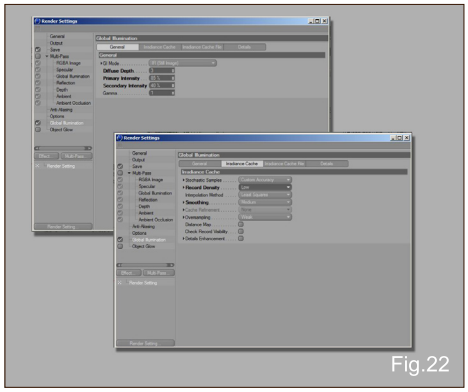

Fig.16


Fig.18


Fig.20

Global Illumination

Now it is time to get the rest of the illumination by GI. For the best effect I used a diffuse depth of 3 with a primary intensity of 85% and a secondary of 40%. The final quality settings are at a high level as you can see in **Fig.22**. For a


Fig.22

quicker preview you can set the Record Density to preview level. The preview render looks quite good even with these low parameters. This kind of illumination is not as artefact-sensitive as others.

The render of the GI pass without any additional light sources shows how big the influence of the Global Illumination in this case is. All the light in this image is coming from the HDRI, which is used to get nice reflections on the surfaces (**Fig.23**).

Final Rendering

The final image was edited in Photoshop for things like color grading and fine tuning. The multipass option delivers channels like the depth channel and the reflection pass separately. There are a lot of routes to get a satisfying result.

The several reflectors I placed into the scene do their job and add a more controlled influence to the final render. They simulate the light being bounced by walls outside and inside the room. With the final render settings and a bit of post work our image could now look like this. You can increase the parameters of course. It just depends on how much time you are willing to spend on the render and how much performance your machine has (**Fig.24**).

So have fun and good bye for now, Fredi.

Scene created by:
Viktor Fretyán

Textures supplied by:
3DTotal Total Textures

Tutorial by:
Fredi Voss
For more from this artist visit:
http://fredivoss.cgsociety.org/gallery/
Or contact them:
vuuxx@gmx.de


Fig.23


Fig.24

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Maya + mental ray

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Scene Created by: Viktor Fretyán | Tutorial Written by Luciano Iurino

Environment Lighting

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Chapter 5 | October Issue 062
TV-Lit (Night-Time) with Low-Level Lighting

CHAPTER 3 - ARTIFICIAL LIGHT

Software Used: Maya and Mental Ray

Welcome to the third part of the Interior Lighting Tutorial. This time we'll try to create a light rig for a night time environment with a strong artificial light coming from above.

Open the NightTime01_START.mb scene file. You should already be familiar with it: it's the same scene from the previous parts of the tutorial (**Fig.01**).

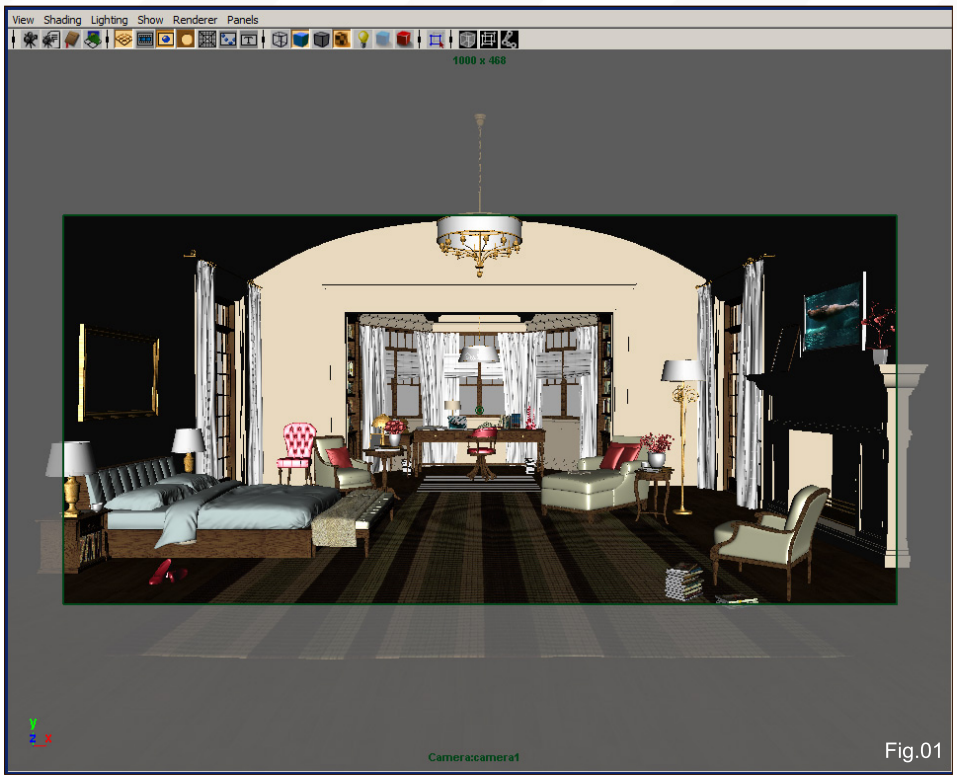
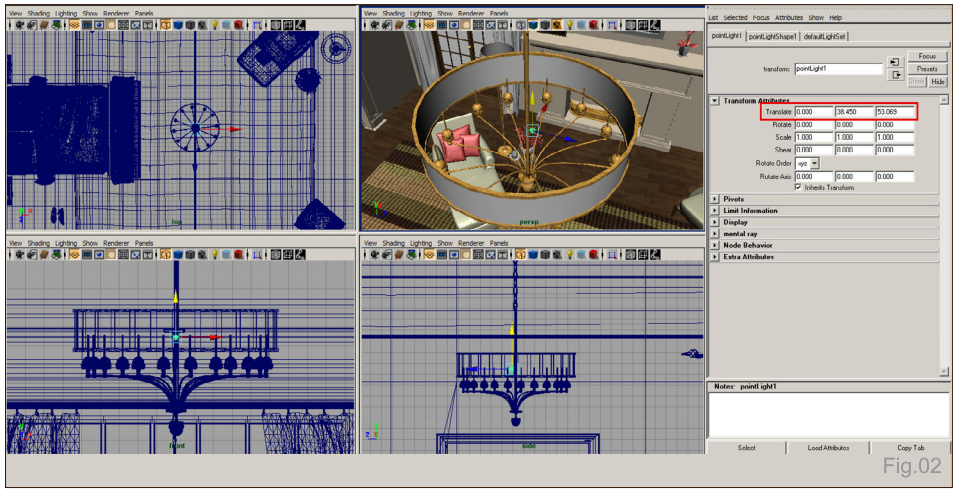


Fig.01

Our main light source will be the big swinging lamp in the main room. Create a Point light and position it right over it, like shown in (**Fig.02**). Before continuing it's time to set the render engine. Open the Render Settings panel and choose mental ray as the renderer (**Fig.03**).


Fig.02

We won't use a precise color for this light; instead, we'll just plug a Mib_cie_d node into it's color channel. This way we'll have a realistic color for our light (**Fig.04**).

The lower the Temperature value, the warmer the light's color will be. For this tutorial we're using a Temperature value of 5.500, and an Intensity value of 2 (**Fig.05**).

Let's go back to the Point light's attributes. Set its Decay type to Quadratic and increase its

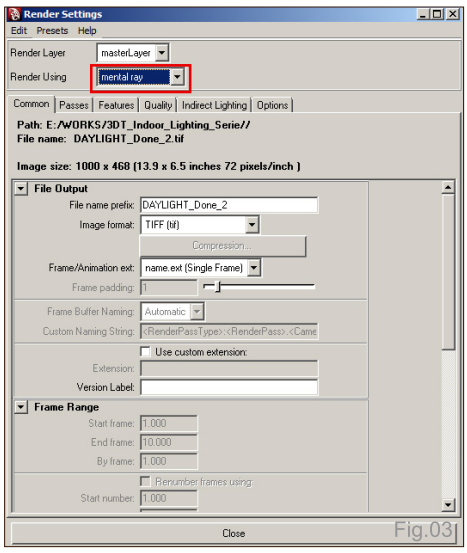
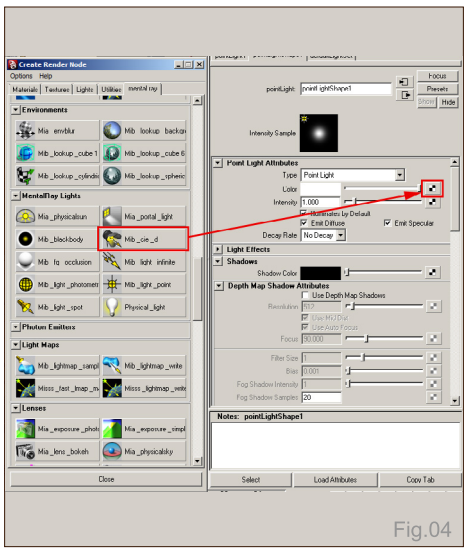
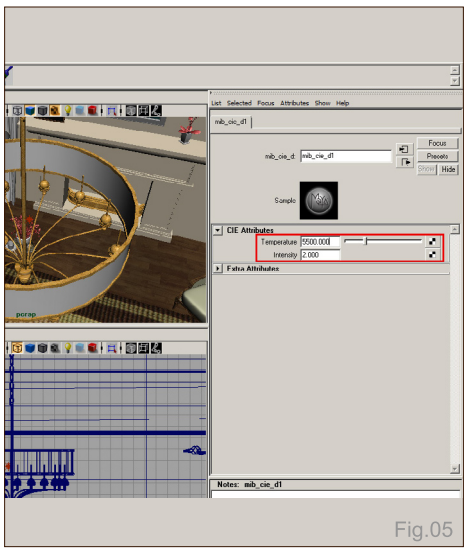
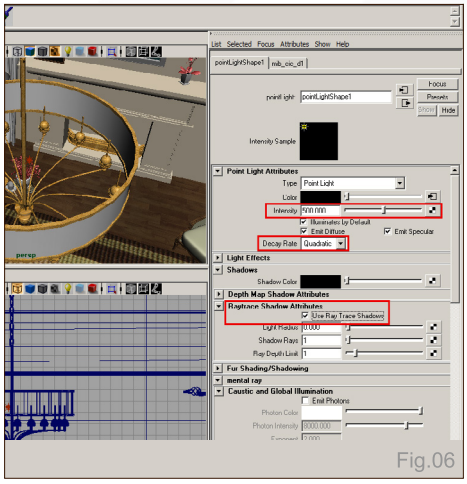


Fig.03

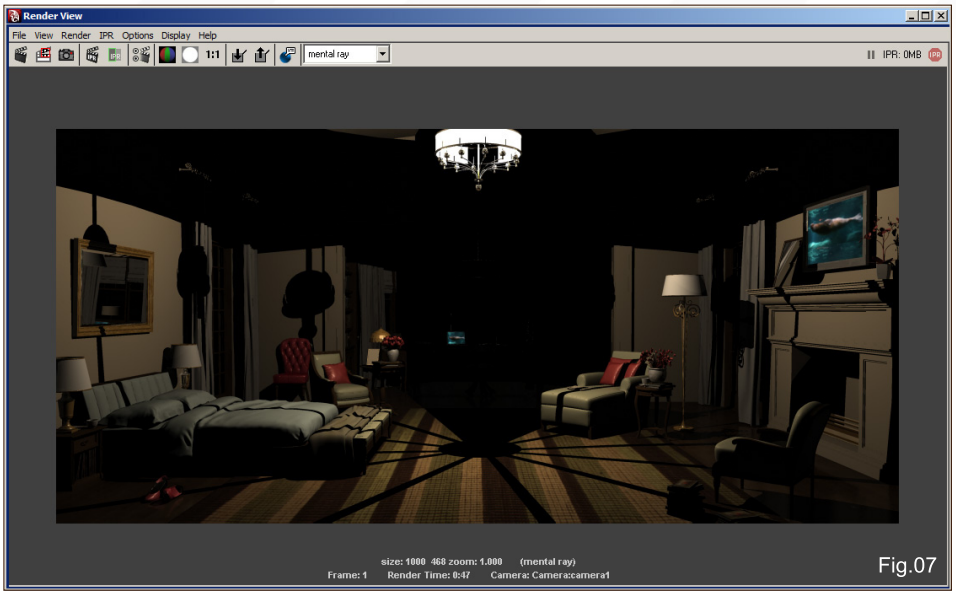

Fig.04


Fig.05

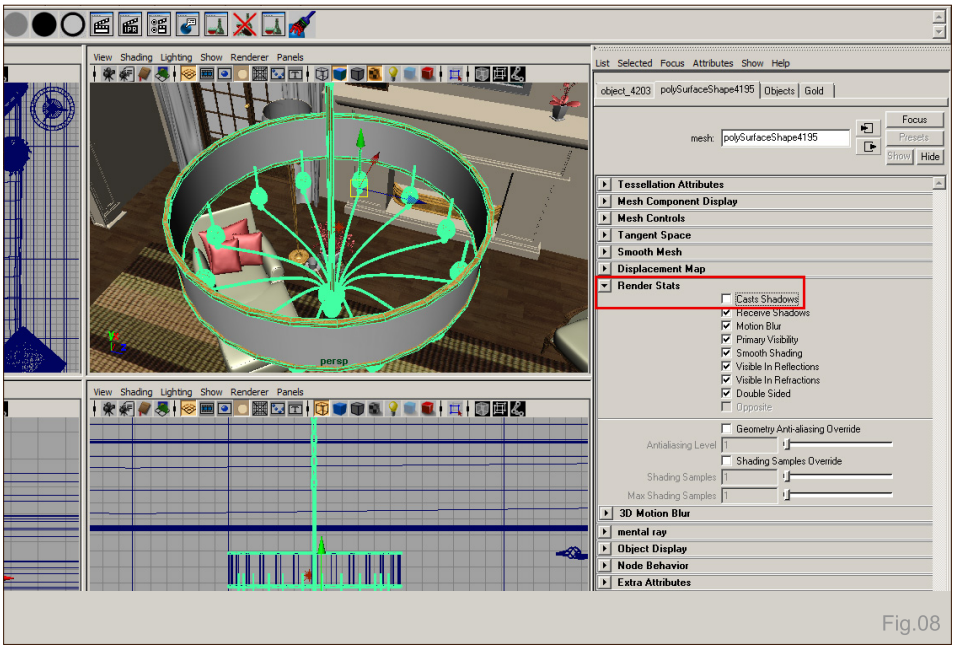

Fig.06

Intensity to about 500. Also, enable Use Ray Trace Shadows, since strong artificial lights like this one usually cast solid and hard shadows (**Fig.06**).

In **Fig.07** you can see a quick preview render. While there's a nice shadow in the upper part of the room, the lamp is casting too many shadows around the scene. It may be realistic light behaviour, but it's not so pleasant to see.

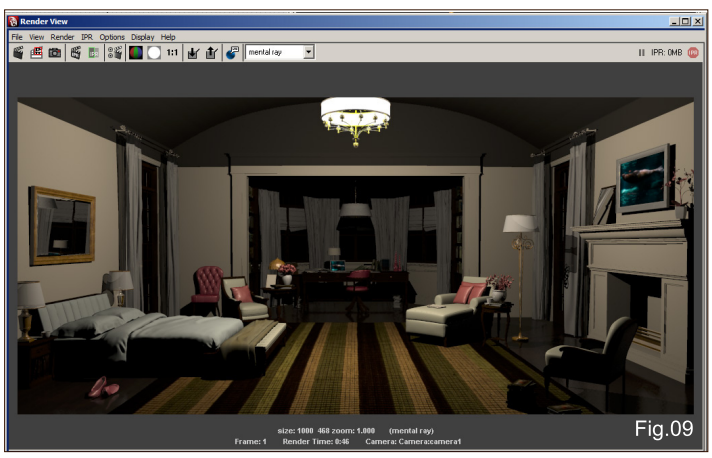

Fig.07

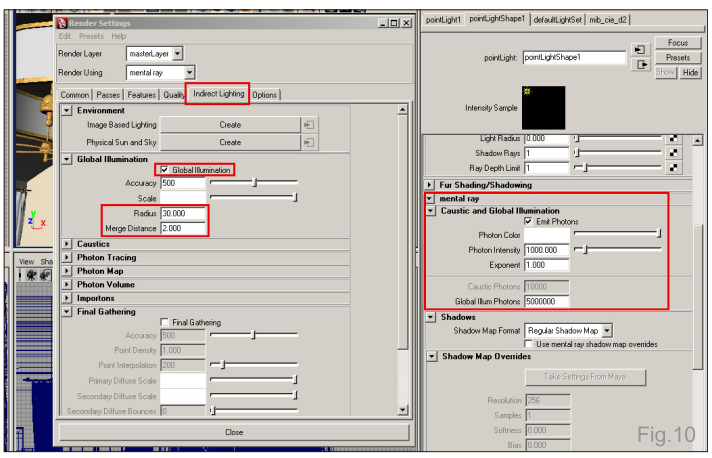
Select the lamp structure shown in **Fig.08** and turn off the Cast Shadow feature in its Render Stats.

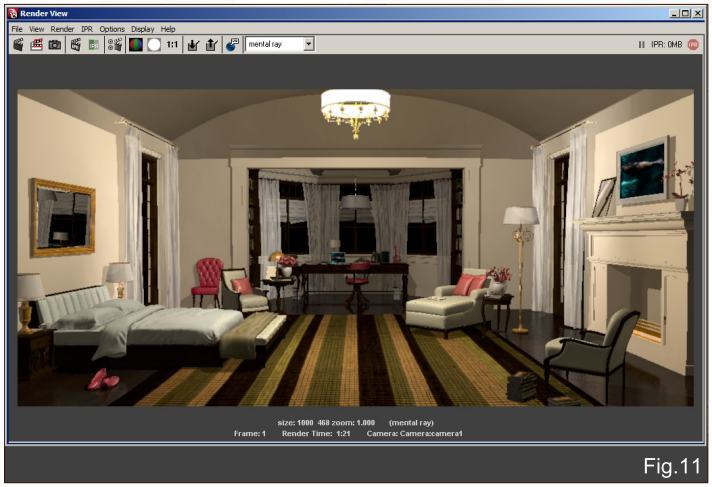

Fig.08

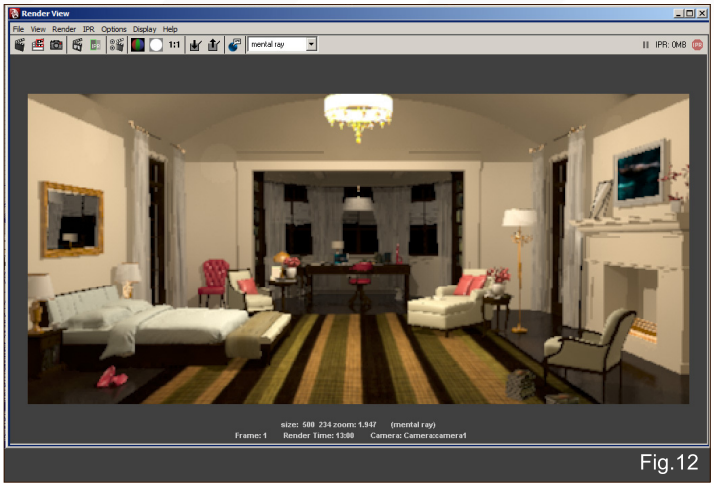
Now it's much better; the bigger shadow is still there, in the upper part of the room, but there is much less clutter (**Fig.09**).

Now it's time to add some light bounces, to make the dark corners look brighter. Open the Render Settings panel and enable the Global Illumination feature in the Indirect Illumination tab (**Fig.10**). Also, select the Point light and enable its Emit Photons option in the mental ray/Caustic and Global Illumination tab. Set the Photon Intensity to 1000, the Exponent to 1 and the Global Illum Photons to a quite large value (for this tutorial, a value of 5.000.000 was used).

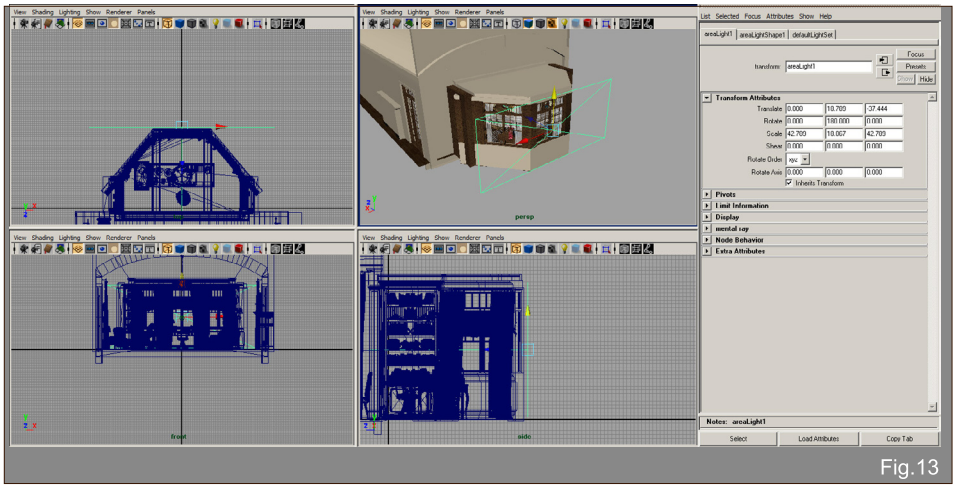

Fig.09

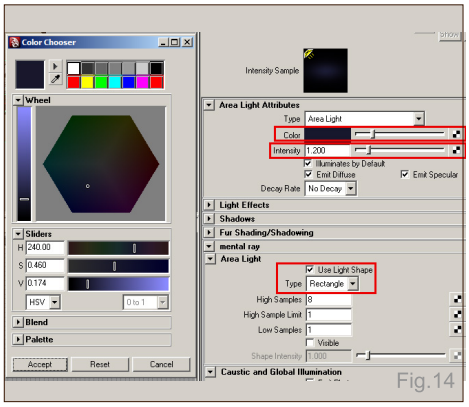

Fig.10

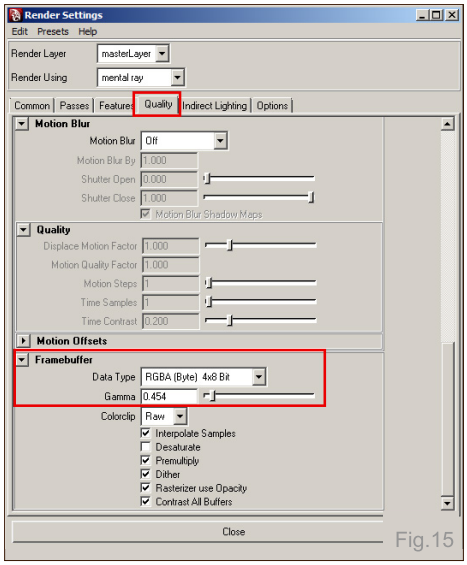

Fig.11

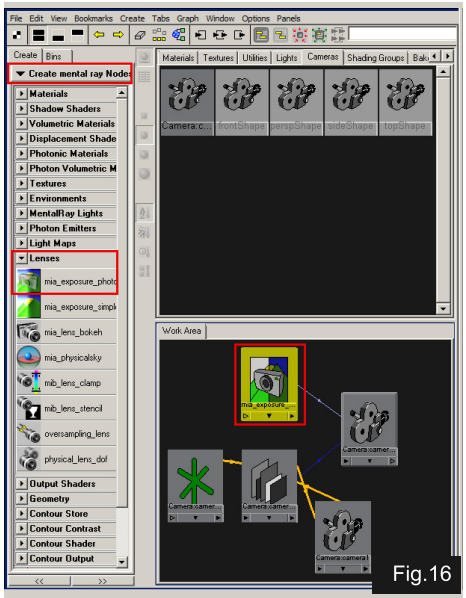

Fig.12

Render the scene again. Now it's much better. If you get strange spots and splotches all over the walls, try to find the right values for the Radius and Merge Distance in the Indirect Illumination tab (Render Settings). These values may change from scene to scene, and it strongly depends on your scene size and measure units (**Fig.11**).


Fig.13


Fig.14


Fig.15


Fig.16

Let's add some more realism using Final Gather. Go back to the Render Settings/Indirect Illumination tab and enable Final Gather. Leave its parameters as they are at this stage. Do another quick test render (**Fig.12**). The resolution and general quality of this render are lower than the previous one, since Final Gather requires longer render times; just use lower values and lower resolution while doing test renders to avoid wasting too much time.

Now that we've set our main light source, let's add another light to the scene. This light will represent the cold light coming from outside the windows. Create a new Area light and position/scale it as shown in **Fig.13**. Don't forget to make it point inward!

Set its color to a very dark blue and its Intensity value to about 1.2 (**Fig.14**).

Now open the Render Settings panel once again and reach the Quality tab. Set the Gamma value to 0.454 in the Framebuffer section (**Fig.15**).

Open the Hypershade and select the active Camera. Connect a mia_exposure_ photographic node to it (**Fig.16**).

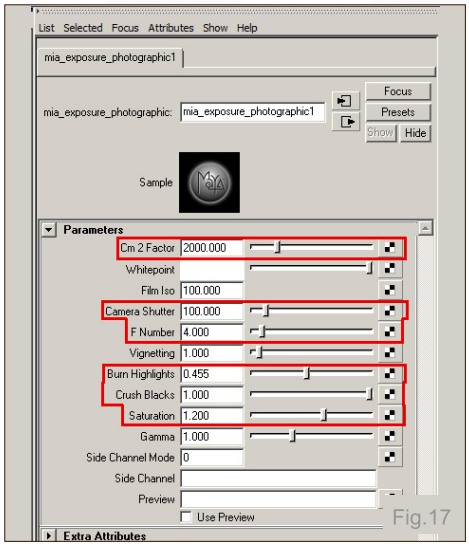


Fig.17

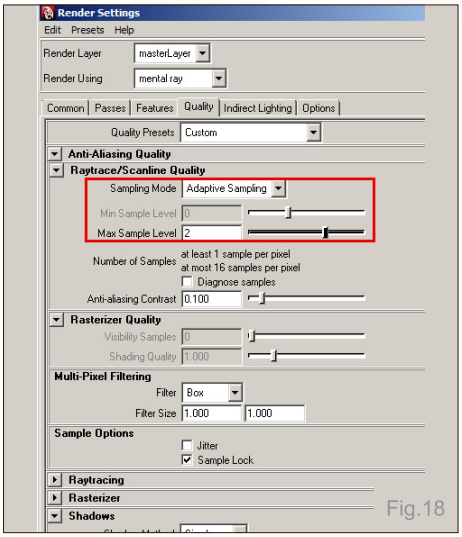
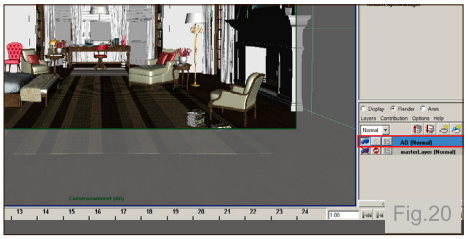


Fig.18


Fig.19


Fig.20

In **Fig.17** you can see the values used for the mia_exposure_photographic node, but feel free to experiment with different values and try to find the final look you desire for your rendering.

Before rendering the final color pass, make sure to take care of the Anti-Aliasing quality. Set the Max Sample Level to at least 2 (or try with even higher settings if you have a powerful PC or a lot of time to waste waiting for the render to finish...).

In **Fig.18** you can see the final color pass. Make sure to save the picture with its alpha channel enabled. It will be useful later in Photoshop for the compositing task.

As usual, we also need an Ambient Occlusion pass. Create a new render layer and name it AO (**Fig.19**).

Create a new Surface Shader in the Hypershade and connect a mib_amb_occlusion node to it. Finally, assign the Surface Shader to the render layer you created in the previous step (**Fig.20**).

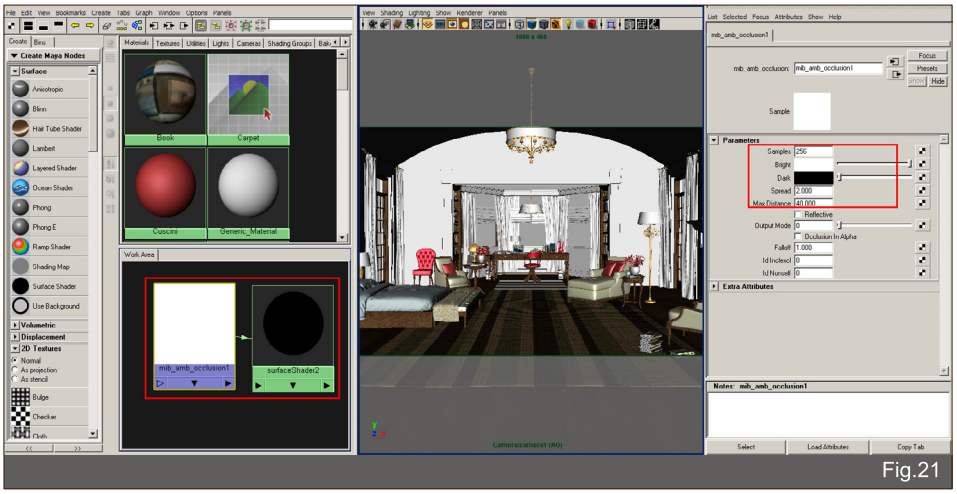
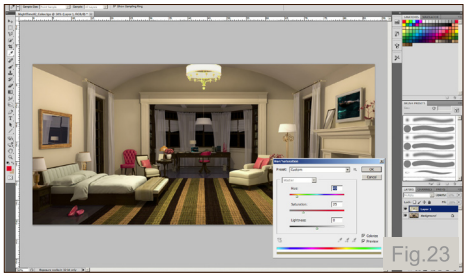

Fig.21

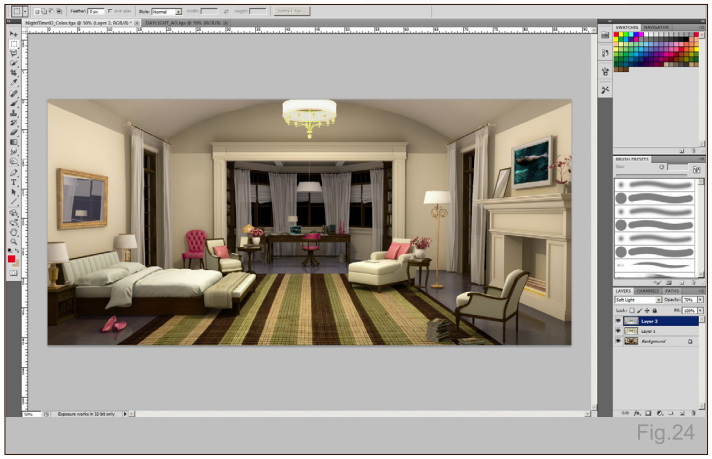

Fig.22

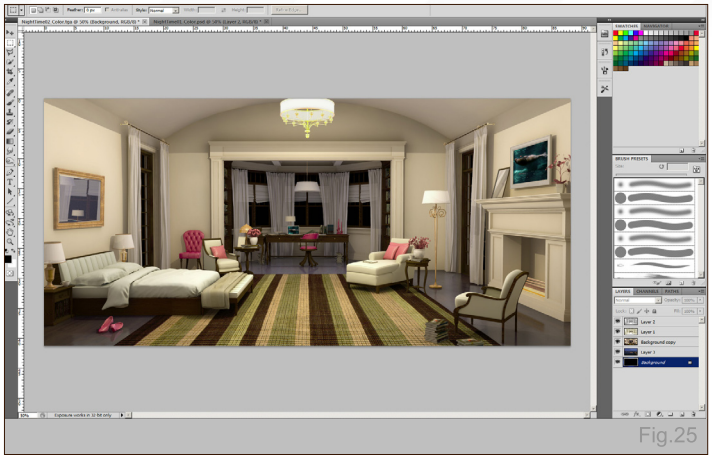

Fig.23

Make sure you have selected the AO render layer and render the AO pass (**Fig.21**).

Open both the color pass and the AO pass in Photoshop. Paste the AO pass over the color one. Set its Opacity value to about 65%. Set its blending mode to Multiply and use the Hue/Saturation tool to make it more yellow-ish (**Fig.22**).

Paste another copy of the AO pass into the picture. Set its blending mode to Soft Light and its Opacity to 70% (**Fig.23**).

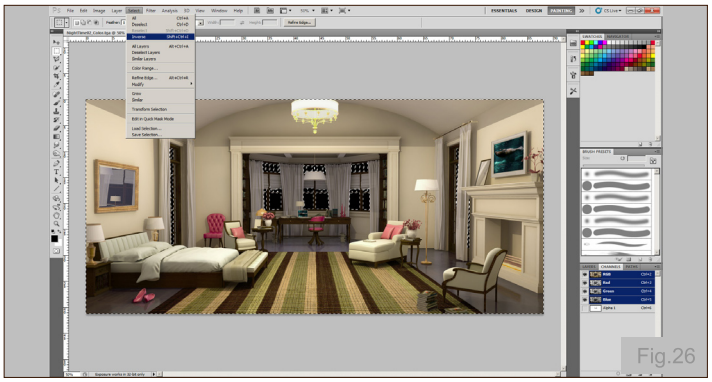

Fig.24


Fig.25

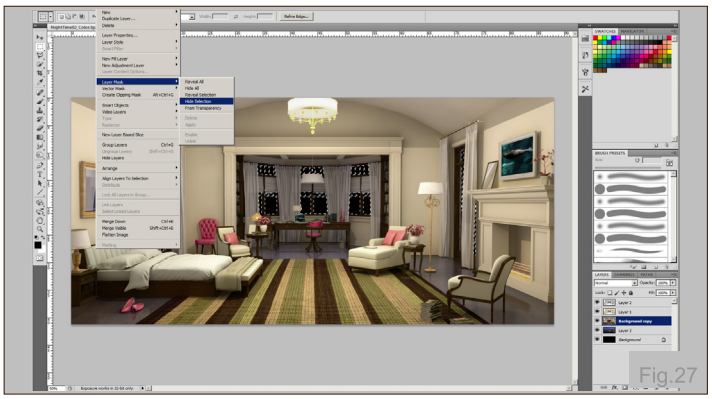
Find a nice background picture. We need to put it on another layer below the main color one. Try finding a nice picture of city lights on Google and paste it below the color layer (**Fig.24**).

Select the Alpha channel you saved earlier together with the rendered picture and invert it (**Fig.25**).

Create a new Layer Mask (from the Layer menu) using the Alpha selection as shown in (**Fig.26**).


Fig.26

You can also use the same Alpha channel to select and duplicate the inner part of the windows (make sure to be on the background/city lights layer) (**Fig.27**). This way you can apply a Glow filter to add a nice effect (**Fig.28**).

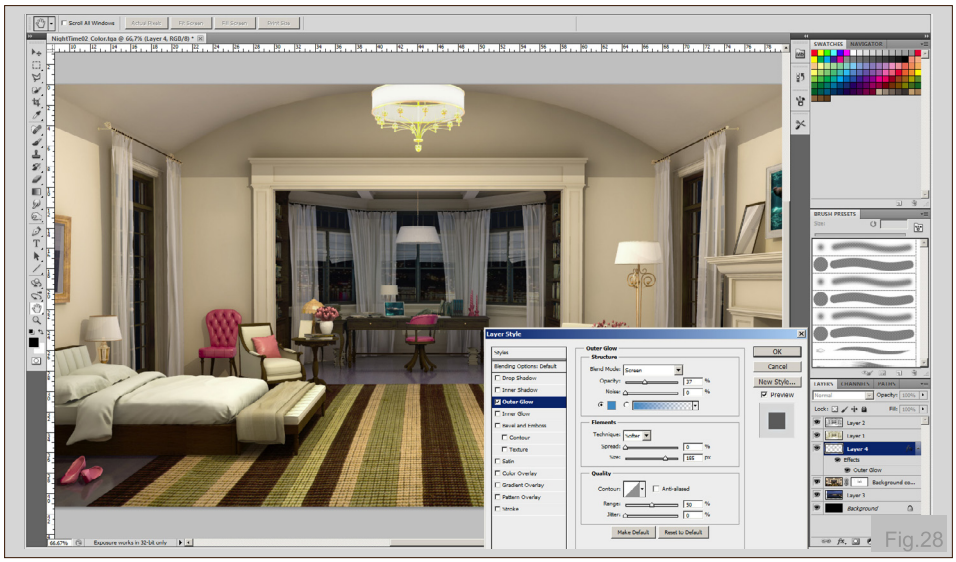

Fig.27

Scene created by:

VIKTOR FRETYÁN

Textures supplied by:

3DTOTAL TOTAL TEXTURES


Fig.28

Tutorial by:

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